The RUBBER AGE

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Baldwin Under Fire as Committee Begins Restriction Inquiry

Members of House of Commons and British Rubber Interests Launch Attack on Baldwin for Appointing Civil Research Committee to Make a Special Investigation of Rubber Restriction—Premier is Unperturbed—Retirement of Restriction Expected

WITH the fate of British rubber restriction admittedly lying in the hands of the Civil Research Committee to which Premier Stanley Baldwin referred the subject on February 8 for investigation and recommendations, the famous British legislation has come in for more heated discussion in the last month than in the preceding three years. In particular, the action of Premier Baldwin in ordering the inquiry has called forth considerable debate in Parliament and the Premier has had a hard time sustaining his position in the face of numerous questions addressed to him from the floor of the House of Commons.

Action of Committee Doubtful

While the discussion has brought forth again the well-known arguments for and against restriction, it was not productive of any information whatever as to the probable decision of the committee. The Premier declined to attempt a forecast of any kind. The general concensus of opinion in rubber circles appears to be that the continuance of restriction will depend upon the action of the Dutch planters. If the threat of removing restricting completely, which the committee inquiry is taken to be, should fail to induce the Dutch to cooperate with the British restrictionists in some effective way, then some plan for "getting the British out from under" as soon as possible, is believed to be the probable result of the committee's work.

Prominent among those who disapproved the step taken by the Premier was the Rubber Grower's Association of London. In a statement addressed to the Government, the R. G. A. "deplored the manner" in which Mr. Baldwin's first announcement "has been sprung on the industry" and trusts that the inquiry of the Civil Research Committee "will not be unduly protracted." When asked if he would give any assurance that long notice would be given of any alteration in the restriction scheme, so that the trade might be able to carry on in the assumption that the present scheme would continue in force for at least twelve months, Mr. Baldwin replied that he could not "anticipate either the nature of the Committee's report or the action of the Government will take on receiving it."

The copy of the Treasury Minute, dated June 13, 1925, appointing the Committee of Civil Research, defines this body as a standing committee, composed of cabinet members, with the Prime Minister as president or another minister designated by him as chairman, "analogous in principle to the Committee of Imperial Defence." It therefore becomes something in the nature of a sub-committee of the Cabinet and under the precedent which has prevailed, it has not been customary to make known its actual personnel. It is known, however, that Lord Balfour has been appointed chairman on several occasions, but in all probability he will not act in that capacity in the instance of this inquiry and the duty will perhaps fall to Mr. Amery, Secretary of State for the Colonies.

CIVIL RESEARCH.

Copy of Treasury Minute, dated 13th June, 1925, appointing a Committee of Civil Research.

Presented to Parliament by Command of His Majesty.

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Formal Notice of the Establishment of the Committee Which is Now Reviewing Restriction

It is generally believed in British rubber circles that the announcement of Mr. Baldwin was actuated by Lieut. Col. Sir Matthew Nathan, chairman of the Rubber Advisory Committee, who recently returned from the Far East after making a survey of the restriction situation and the present administration of the Scheme.

"Leak" Being Investigated

The question of the supposed "leak" in publishing the announcement, which resulted in the news being known in New York earlier than in London was a subject for further questioning of the Prime Minister in Parliament. Sir Robert Hutchinson asked the Prime Minister if he could say why the intimation that the rubber restriction scheme was to be referred to the Committee of Civil Research was not issued from the Colonial Office; why this information was known in New York before the City of London; and who was responsible for the issue of this information.

Mr. Baldwin replied: "The appointment of this inquiry was announced by my office rather than by the Colonial Office because it had reference to the Committee of Civil Research which is a Cabinet Committee. The announcement was issued about 6 p. m. on

February 8, and was expressedly marked for publication in the press on Thursday morning, February 9. If the notice was made known in New York on February 8, it can only have been by a misunderstanding on the terms on which it was issued to the press representatives."

In an analysis of the effect of the "leak" on the New York market, the Department of Commerce has made public the following careful study of the facts:

> "While it is understood that the news did reach the New York Rubber Exchange by cable on February 8, at about 2.30 p. m. (New York time), the closing price (3 p. m.) of 36.60 cents as compared with 36.80 cents on February 7, and 36.50 cents on February 6, showed that it had no immediate market effect that night. The outside market was similarly unaffected. London prices on February 8 closed at ls. 5-7/8d.; on February 9, according to the London *Times*, 'Market uncertainty was created by the Prime Minister's announcement. Prices declined steadily under heavy selling, prices at one time being down 21/4d on the day, closing 1 1/2d. lower on balance.' This was before the New York market opened, and New York followed the London lead, the closing price February 9 on the Exchange being 34.50 cents. Prices remained fairly steady until February 13-14, when they declined in London, New York dropping in sympathy February 14, to about 31 cents. the decline originally started in London both February 9 and February 14."

In the meantime, comment from the British press and London rubber circles has continued to be critical of the Premier's action while at the same time expressing widely divergent views on the efficacy of the continuation of the restriction policy, with the majority of opinion leaning toward favoring the abolishment of the scheme.

The *"Times Trade and Engineering Supplement"* (London, February 11), commenting on the announcement, states:

> "This means that the failure of the restriction scheme is now officially recognized. * * * The scheme failed solely because it ignored the fact that rubber is not a British monopoly and that any reduction in the British output might be offset by increased foreign output."

The *Economist* (London, February 11), welcomes the inquiry with the following statement:

> "Various changes have been made (in the scheme) from time to time, but the general effect has been to stereotype British production at a level which taken over the 5 years of the scheme's existence, shows little change from that of the years 1920 to 1922, an increase in world demand over the same period of about 55 per cent having been taken up by increased output on the part of producers outside the Empire. As the British Empire last year produced only 49½ per cent of the world's rubber, as compared with an average of 72 per cent in 1920-1922, the maintenance of restriction in an effective form has tended to entail growing hardship on many producers, and as recently as the last three months numerous estates in Malaya have suffered curtailments of their assessments averaging from 15 to 20 per cent."

The London *Statist* (February 11) says:

> "There can be no doubt that those responsible for the reenactment of Restriction on present lines have brought about a most difficult situation, and one from which it will not be easy to extricate the British plantation industry. This, apparently, has now been realized by the Government, and an announcement has been made this week upon which it is scarcely necessary to comment. Into it can only be read a growing uneasiness on the part of the Government regarding the working of restriction."

The Government announcement also excited the Malayan press to make strong pertinent comments.

The *Straits Times*, always a stalwart champion of restriction, advises calmness, declaring that if restriction goes it will be a comfortably long time dying.

The Singapore *Free Press* expresses the the hope that the Committee will not report too hastily, and is pessimistic as to the possibility of reaching any agreement with the Dutch.

The anti-restrictionist viewpoint is supported by the Penang *Gazette*, which argues that the producing industry retains sufficient vitality to rehabilitate itself in open competition. It suggests that it were better that a number of weak plantations failed now rather than that a continuance of the present economic policy eventually dragged down the weak and the strong together.

In Ceylon it is reported that a motion introduced in the Ceylon Legislature recommends to the government the urgent desirability of acceding to the general opinion of local rubber interests in removing the rubber restriction measures.

Rubber Planting Course Is Established by University

Fundamentals of Rubber Planting Now Being Taught in Michigan University—Such Work Not Previously Available in the United States—Matthews and LaRue in Charge

THE fundamentals of rubber planting and rubber plantation management are being taught in a course which is the first of its kind to be offered by any American University. As a part of its school of forestry and conservation the University of Michigan, located at Ann Arbor, has established a course under the general heading of "Rubber Plantation Management." Those in charge of the work report that the course has immediately attracted a large number of students which they believe to be indicative of America's present interest in rubber culture.

C. D. La Rue

D. M. Matthews

Professor D. M. Matthews, an experienced tropical forester who holds the chair of Forest Management at the University, is the organizer of the new course. He will personally give about one-half the instruction. Prof. Matthews has spent many years in the tropics in forestry enterprises, and tropical agriculture, including rubber. His lectures will cover the economic and financial aspects of rubber plantation management.

The technical and botanical aspects will be treated by Prof. Carl D. LaRue who has been a member of the University's department of botany for some time. He is best known in connection with rubber by reason of his work on the plantations of the United States Rubber Company and as the head of the investigating party which located Henry Ford's present concessions in the Amazon Valley. Prof. LaRue was also a member of the crude rubber survey party of the U. S. Department of Agriculture which visited the Amazon in 1924.

"The outline of the course," Prof. Matthews state, "covers a very wide field and in the present semester it will be possible for us to touch only on the high points under each of the different headings. As this is the first attempt at work of this nature in the University, we are aiming to do no more than break ground for more intensive work later, should there be a demand for it.

"We feel that the course will have the effect of directing attention toward our national dependence on the tropics for many of our essential raw materials and the necessity of our taking our share of the responsibility for the production of them if we are not to run the risk of paying exorbitant rates to those who are willing to take the responsibility. Also, we are reasonably certain that it will result in some capable men turning their attention to the tropics as a field of work. We have been surprised and pleased at the interest shown in the course as more than twenty senior and graduate students have elected it. This we believe indicates that it may be desirable later to give one or more intensive course, elaborating some of the more important points which at present we are able only to discuss briefly."

Before inaugurating the work, Prof. Matthews discussed his plans with several men prominent in the American rubber industry who are said to have approved the project heartily.

Recent Progress in Methods of Tire Manufacture

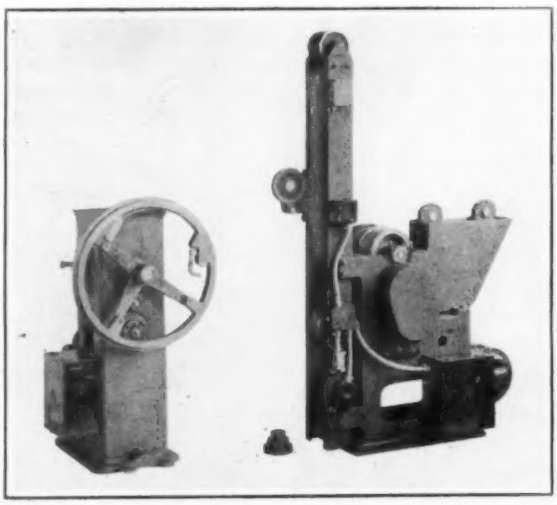
Although Tire Manufacturers Do Not Immediately Adopt New Methods, Experimentation is Continually Carried on to Develop New Ideas—This Article Reviews Some of the Methods Adopted in Recent Years

THE process of making a tire cannot be said to be a complicated one. Yet behind the process is a wealth of engineering and study of methods which has been instrumental in giving the motor riding public the greatest tire value in history. These achievements, coupled with the improvements brought about by the chemists in compounding and handling of stocks, tell the complete story. This article will treat entirely with the changes in methods and machinery, whereas a later article will cover some of the changing trends in tire and tube compounding.

It should not be inferred from this that there is uniformity of methods and standardization of machinery in tire manufacturing to-day. As a matter of fact there is less of it now than there was ten years ago. Some plants are building on cores and some on the flat drum; some are running cord fabric from cones and others from fabric in rolls; some are curing in pot heaters, others in watch-case vulcanizers, and so on. In the large companies especially, experimentation is constantly going on with every new method and machine offered, either to build a tire better or to build it just as good but at a lower cost.

Tire Sizes Being Reduced

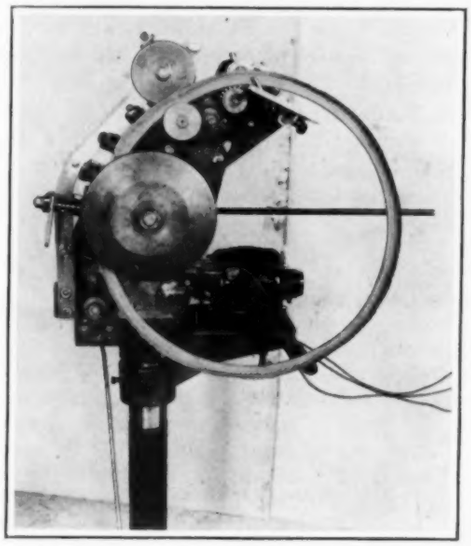
Thus we are in a more or less transitory period. Unless another radical change in design such as the shift from the high pressure tire to the balloon tire takes place, the lot of the tire manufacturer is destined to be an easier one so far as multiplicity of mold equipment goes. Such sizes as 30 x 3½, 32 x 4 and 33 x 4 are gradually dropping out as new motor equipment comes into use and the old is discarded. Within a relatively short time they will join the ranks of the old q.d. sizes, 37 x 5's, 30 x 3's and others which are now pretty well scrapped. Balloon and heavy duty truck pneumatics now occupy the stage of interest in the manufacturing plant.



Semi-Automatic Continuous Bead Making Machine

Illustration Shows the Grommet Winder at Left and Pull-Off Drum with Storage Rack at Right. A Tuber and Reel Stand Are Used in Conjunction with the Units Shown

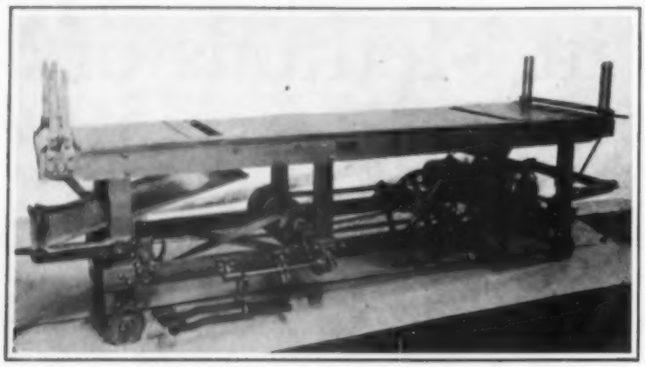
The savings to be had from buying cord fabric on cones instead of in fabric form are quite apparent. The cost of weaving in the cotton mill is eliminated. At the plant the cell dryer or the can dryer passes out of the picture. Better alignment is obtained after running through the calender which means more regularity and uniformity in the tire.



Utility Crimper Type Bead Flipper

Yet even the mills equipped to run from cones do not use them one hundred per cent. Tire fabric looms have not been scrapped yet by any means. The answer is that the tire manufacturer to-day never jumps into a new departure at one leap. Experience has shown that it is better to run the old along with the new, thus affording an adequate chance to compare results and costs. Years ago, especially when the fabric tire was in vogue, a great deal of attention was paid to getting a perfect union between the rubber and cotton. Then it was either a question of spreading or driving it in with a soft hot friction run with a thin "pencil" bank. Nowadays spreading has been forgotten as too slow, expensive, and unnecessary, and gum dipping has come in. The frictioning of cord fabric is still current practice, but very often the second side is omitted without any detrimental results.

More attention is being paid to guage. Closer control is possible with developments like the Weightmeter. Experience has shown that if the amount of stock in the mold is correct, and the airbag pressure constant, the flow of rubber during vulcanization will unite the rubber and fabric



DeLaski & Thropp Fabric Splicer (Spool Winder)

securely unless there is some other factor such as unevaporated naptha or excess moisture in the fabric to prevent it. Indeed, fabric separation in tires is almost unknown to-day.

The bead was an old cost bugbear in the tire but all that has been changed. The time honored process of forming the bead on a grooved wheel, either hand or machine propelled, then semi-curing it for 15 minutes in a mold, with the necessary after-trimming before cementing, has been largely superceded by a simple continuous process. The flat braided wire is run through a tubing machine to impregnate it with rubber compound, then into a cooling tank and on to a drum for storage adjacent to the bead forming machine which automatically grips the braid when closed and releases when opened for taking off the grommets. This machine (a Banner product) has a gear shift lever for stopping automatically at 2, 3, 4, 5 or 6 wraps. The advantages are set forth as follows: high output per man hour (as high as 6 beads per minute, depending on the size); only one operator required for the unit; beads are wound under uniform tension and while the insulating compound is fresh, insuring greater adhesion; no waste of tape, and the elimination of soapstone and liners. This machine is often used in conjunction with the Utility bead flipping machine which applies the flipper, and the bead is ready to go to the tire builder.

Flat band building is a much talked of process for building tires, but like the running of cord from cones, it has not been adopted one hundred per cent by the industry by any means. It has been used for nearly five years, and in many plants is now running side by side with core building, while others are using it almost entirely, with a minority leaving it entirely alone. When the meshes of competition began to tighten round the tire industry six or seven years ago, the first drive was made to cut the corners in the cost of a 30 x 3½ tire which was original equipment on Ford at the time. Engineers studied the problem from all angles and one of the first points which struck them was the amount of extra effort and machine strength required to form fabric and rubber round the core in building a tire. So the flat band methods came about. One of the earliest attempts saw girls building such tires on flat pulleys, and forming them by inflating a heavy inner tube on the inside of the tire. From these efforts machines for flat building have been developed which are now available for the whole industry.

The machines made by the Banner Machine Company for building tires in flat form are licensed by the United States Rubber Company. The two primary features of the system are that the tire is built in the form of a flat band, upon a drum, and that it is given the tire shape by applying suction to its outer face, leaving its inner face unobstructed for the insertion of the curing bag. Uniformity of structure is easily obtained in the flat band method because there is no radical stretching nor shaping of the fabric in applying it to the drum, and in the vacuum expansion of the tire the cords take their natural and proper positions in the carcass in response to conditions which are always uniform.

Banner Drum Tire Building Machine

Banner Rubber Seal Vacuum Expander

In building tires in flat form the carcass fabric is either made up in ply lengths and booked, or spliced into lengths and rolled in a liner for vending from a stock turret at the tire building machine. The long length fabric has the advantage over ply lengths in that it permits greater speed in application to the drum and is more convenient to handle. It is easily and rapidly spliced in power driven apparatus at the bias cutter.

Fewer Fabric Widths Needed

The variety of stock necessary in flat band building is considerably reduced as rim diameters can be disregarded, all tires of the same cross section being built of the same width of fabric. The stock turrets are built for 1, 4, 6, and 8 rolls of fabric, and aid continuous production as they can be filled while the machine is in operation.

In adopting the flat band process, one of the first questions to decide is the type of building drum most suitable for the particular installation. Small clincher tires are built upon solid flat drums of a diameter to insure a snug fit on the mold rings but should not be of such a tight fit as to interfere with the rapid rimming of the tires. With straight bead tires there is a choice between two types of

drums, the flat segment drum which expands and collapses, and the shouldered drum which collapses only but is adjustable in width.

Once the tire is built and removed from the drum, it has to be expanded before the bag is inserted and it is placed in the mold for curing. Expanding flat built tires by the vacuum process maintains the uniformity of structure which is attained in building the tire in flat form, the atmospheric pressure on the inner face of the tire causing it naturally to take the shape which it will assume when inflated for service, the cords being free to assume their proper and natural positions. This radically distinguishes the vacuum process from mechanical expansion. The operation of a vacuum expander is extremely simple. A flat built tire is set horizontally in the central opening of the box. The vacuum line valve is opened and the tire is drawn outwardly into the box, which causes the beads to move relatively toward each other. An airbag is then doubled and snapped into the formed tire. With the curing bag inserted, the lid of the vacuum box is swung open and the bagged tire removed and rimmed.

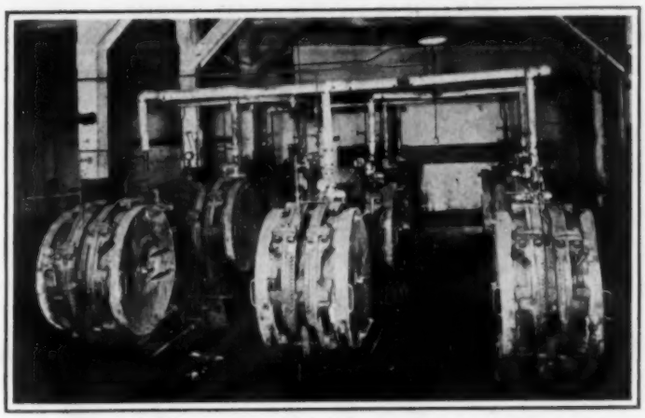
Scope of Flat Band Building Process

In discussing flat band tire building, it is only summarizing the results thus far to say that the process is more successful with 4-ply tires and small sizes than it is with the heavier, larger tires. What the ultimate result will be time alone will tell.

Meanwhile machinery for building tires on cores has been improved and speeded up. In fact, every new process gives stimulus to improve those already in use. Treads once applied by hand after the carcass was formed by machine are now applied by machine. Stitchers are operated by motor instead of by hand, and automatic compressed air shut-offs aid production.

Truck and bus tires were built entirely by hand when first developed but now they are machine built. The De Laski and Thropp Giant tire building machine will produce any size tire from a 30 x 3½ to a 40 x 8, thus enabling the manufacturer to run small sizes when not producing truck tires to capacity.

It is claimed that this machine will produce eighteen 36 x 6 ten-ply truck tires finished complete on the machine in 8 hours. To effect change of operation from one size to another no adjustments of any kind are necessary other than changing the building core. To make this change necessitates merely the removal of two bolts and requires but a few minutes. Special tread rollers mounted on an inclined pedestal directly above the fabric stitchers are provided to insure the tread being rolled down properly. This process effectually prevents any air from being pocketed between carcass and tread, and insures perfect firmness of every stitch and anchorage and greatly prolongs the life and service of the tire.

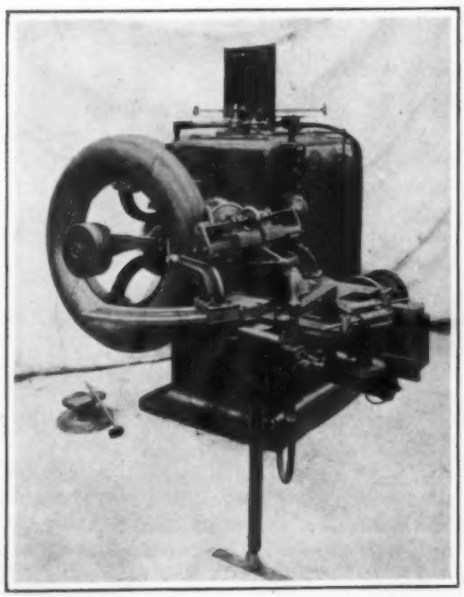


A Battery of 18 "Akron Standard" Watchcase Vulcanizers

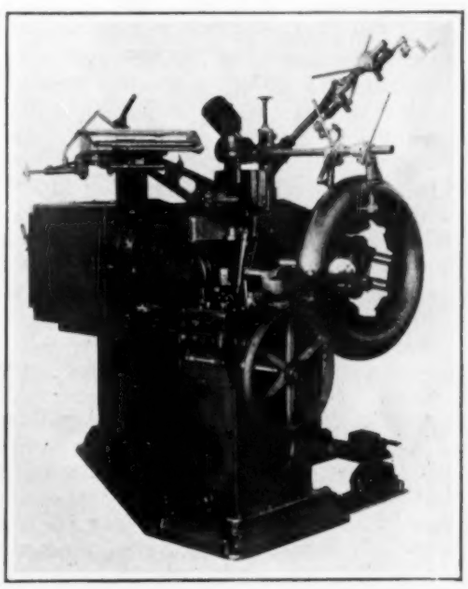
Watchcase or unit heaters are another development which is now being used more or less generally in the tire industry. This device undoubtedly has merit, but its introduction has been slow because curing equipment already installed such as vertical hydraulic vulcanizers represent a sizeable investment. Thus we find more watchcases in the new plants and small companies than we do in the large old line companies although they all have one or more units operating in an experimental way.

Advantages of Watchcase Vulcanizers

As in the case of flat band building, it is an accurate general observation to say that watchcase heaters have given better results with the smaller size and fewer ply tires than with the larger sizes. Advantages are lower equipment investment, quicker change time and labor saving, as one man can operate a battery of watchcases, timing the heats in rotation. Better results are obtained in plants with good boiler conditions, high pressure, dry steam being desirable. Just now all manufacturers are showing great interest in watchcase vulcanizers for molded tubes. Discussion of this process will be presented in a later article.



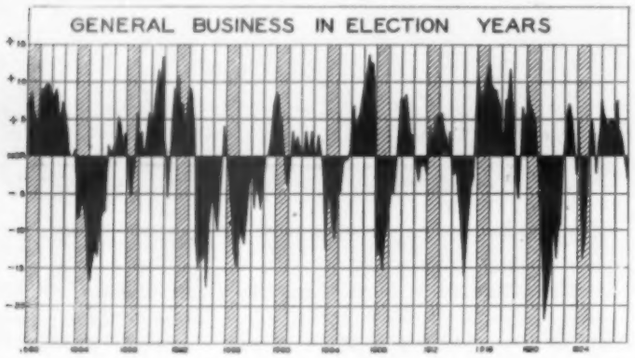
LEFT—De Laski & Thropp Tire Building Machine which is said to produce eighteen 36 x 6 ten-ply tires in 8 hours. It can make any size tire from 30 x 3½" to 40 x 8"



RIGHT — Banner Tire Building Machine—latest improved model for both cord and fabric tires covering a full range of sizes

Business in Election Years

THERE is little reason for business to be apprehensive about the effect of an election year on trade and industry, concludes Col. Leonard P. Ayres, nationally known business analyst, in the bulletin of the Cleveland Trust Company, of which he is vice-president. Following a careful review of business conditions in other election years,



Col. Ayres reports that business has improved in such years more often than it has declined.

During the 48 years since 1880 there have been 12 national election years, and this year will make 13 of them. In the accompanying diagram the black silhouette shows month by month over that long period the fluctuations of business above and below its computed normal level. Each election year is cross hatched in the diagram.

There has been no general rule as to the condition of general business in election years. In six of the 12 the black area is distinctly above the normal level, in five more it is below and in one case it is about evenly divided. The present year of 1928 begins with the black area below the normal level but not seriously so. The black area has dipped downward, however, during the early part of every one of the election years, indicating a hesitancy in business as election years arrive. That such hesitancy is unwarranted is shown by the fact that in seven of the 12 cases under discussion the year has closed with business at a higher level than it held when the year opened.

Exports of Tire Fabrics

There was an appreciable increase in the exports of cotton tire fabric from the United States during 1927, over the volume of such shipments during 1926. A total of 3,453,548 square yards of cord fabric was exported last year as against only 787,105 square yards during 1926. Shipments of tire fabrics other than cord fabrics totaled 1,524,503 square yards as against 1,215,973 square yards the previous year. In point of value, the increase was even more marked, the total exports of both cord and other tire fabrics during 1927 reaching $1,799,652 as compared with $849,762 in 1926. Canada, Australia and the United Kingdom are the largest users of American tire fabrics and these three countries take practically all the material exported. Small scattering shipments also go to Mexico, Sweden and British Malaya.

Age-Rite Powder—New Antioxidant

A NEW antioxidant called Age-Rite Powder was announced on March 1 by the R. T. Vanderbilt Company, New York City. According to the folder describing this material, it is phenyl-beta-naphthylamine, a gray powder, S.G. 1.19, with melting point about 100 degrees Cent. It is insoluble in water, slightly soluble in gasoline or alcohol and freely soluble in benzol. It is said that Age-Rite Powder was developed in the Goodyear laboratories and is being manufactured by Goodrich.

Claims made for this new antioxidant are as follows: It fluxes easily with rubber at ordinary mixing temperatures and does not discolor during mixing; it does not soften or add tackiness to the mix; it is non-toxic and odorless. Age-Rite Powder is intended to resist the action of oxygen, sunlight and heat and is suitable for use in tubes, high-grade treads, light colored goods, footwear and sundries.

The aldehyde-amine condensation product in the powdered form introduced six months ago by the same company and known as Age-Rite Powder will be withdrawn in favor of this new material.

Rubber Testing Laboratories

THE Bureau of Standards has recently published a revised edition of its Directory of Commercial Testing and College Research Laboratories. Contained in the directory are the names of 48 commercial laboratories which offer their services in connection with the testing of rubber. These are listed below. An examination of the list will reveal that additions could appropriately be made to it, but it is nevertheless reprinted as compiled by the Bureau of Standards for the convenience of those who may desire to have rubber testing done. The symbols which accompany each name indicate the character of the tests which the laboratory undertakes and their meaning is explained in a footnote. The list is as follows:

CALIFORNIA

(cpas)* The Twining Laboratories, 2146-2148 Merced Street, Fresno.
(cp) Los Angeles Testing Laboratory, 1300 South Los Angeles St., Los Angeles.
(c) Arthur R. Maas Labatories, 308 East Eighth St., Los Angeles.
(cp) Raymond G. Osborne, Rives-Strong Building, Los Angeles.
(cp) Smith-Emery Co., 245 S. Los Angeles Street, Los Angeles.
(c) Western Precipitation Co., 1016 West Ninth Street, Los Angeles.
(c) H. G. Seifert Laboratory, 464 Twentieth Street, Oakland.
(c) Pacific Chemical Laboratories, 417 Montgomery St., San Francisco.
(a) The Shaw Laboratories, 1155 California Street, San Francisco.

COLORADO

(c) J. W. Richards & Son, 1118 Nineteenth St., Denver.

DISTRICT OF COLUMBIA

(c) Industrial Research Laboratories, 2201 New York Ave. NW, Washington.

ILLINOIS

(cs) Benedict Laboratories (Inc.), 641 South Wells St., Chicago.
(ac) Chemical & Engineering Co., 431 South Dearborn St., Chicago.
(c) The Columbus Laboratories, 31 North State Street, Chicago.
(c) Deavitt Laboratories (Inc.), 209 South La Salle St., Chicago.
(c) Robert W. Hunt Company, 2200 Insurance Exchange, Chicago.
(c) Mariner & Hoskins, 111 West Monroe Street, Chicago.

MARYLAND

(cp) Penniman & Browne, 341 Courtland Street, Baltimore.
(c) Strasburger & Siegel, 15 South Gay Street, Baltimore.

MASSACHUSETTS

(cps) Associated Factory Mutual Fire Insurance Cos., 184 High St., Boston.
(c) Bigelow, Kent, Willard & Co., Park Square Bldg., Boston.
(cp) The Thompson & Lichtner Co., (Inc.), 80 Federal St., Boston.
(c) Dr. A. H. Gill, Massachusetts Institute of Technology, Cambridge.
(cp) Arthur D. Little (Inc.), Charles River Road at Kendall Square, Cambridge.

MICHIGAN

(cp) The Detroit Testing Laboratory, 554 Bagley Avenue, Detroit.
(cp) Perry Testing Laboratory, 210 Third Street, Detroit.

MISSOURI

(c) St. Louis Sampling & Testing Works (Inc.), 211 South 7th St., St. Louis.
(c) H. E. Wiedemann, Chemical Building, St. Louis.

NEW JERSEY

(c) Frederick J. Maywald, 1 William Street, Belleville.
(c) United States Testing Co., (Inc.), Hoboken.
(a) Philip O. Gravelle, 114 Prospect Street, South Orange.

NEW YORK

(c) Touceda Laboratories, 943 Broadway, Albany, N. Y.
(cp) Ira I. Sloman, 117 Thompson Avenue, Long Island City.
(acp) Ekroth Laboratories (Inc.), 461 Eighth Avenue, New York City.
(cp) Electrical Testing Laboratories, 80th Street and East End Ave., New York City.
(cp) New York Testing Laboratories, 72 Washington St., New York City.
(cp) Stillman & Van Siclen Chemical Laboratory Co. (Inc.), 227 Front St., New York City.

OHIO

(cp) The Consulting Co., Union Central Tower, Cincinnati.
(c) Forest City Testing Laboratory Co., 507 Superior Bldg., Cleveland.

OREGON

(cp) E. W. Lazell, 537 Railway Exchange Building, Portland.

PENNSYLVANIA

(cp) Warner Laboratories, 617 First Street, Cresson.
(c) Frank R. Gunn Co., 704 Market Street, Philadelphia.
(ac) LaWall Laboratories, 636 Race Street, Philadelphia.
(ca) Charles E. Mullin, 3820 Sansom Street, Philadelphia.
(p) Riehle Bros. Testing Machine Co., 1424 North Ninth St., Philadelphia.
(c) Samuel P. Sadtler & Son (Inc.), 210 South 13th St., Philadelphia.
(cp) Pittsburgh Testing Laboratory, Stevenson St. at Locust, Pittsburgh.

VIRGINIA

(ca) Norfolk Testing Laboratories (Inc.), 288 Bank Street, Norfolk.

*Meaning of references—(a) Appearance, optical, microscopical tests; (c) Chemical tests; (p) Physical, mechanical tests; (s) Service, performance, calibration tests.

Changed Driving Conditions Lower Tire Mileage

American Automobile Association Makes Study of Factors in Modern Driving Conditions Which Lower Tire Mileage

THE average mileage obtained from automobile tires has shown a great decrease recently, due to tremendous changes in driving conditions, the American Automobile Association has announced following a survey of the records of the emergency road service departments of its 958 member clubs throughout the United States and Canada. The effect of the driving changes has been sufficient to nullify the improved quality which tire manufactures have been building into their products, the Associations says. In some cases, mileagae has decreased as much as one-half.

The Association's statement was cited as an additional reason why Congress should approve the bill now before it to legalize combined purchasing of raw materials produced abroad under monopoly conditions. This legislation is known as the Newton bill and is aimed primarily at the British restriction of rubber exports. If changed driving conditions are to make the manufacture of a greater number of tires necessary, it is said, this country should take every safeguard to assure itself an ample supply of rubber at a reasonable price.

The salient features of the changed driving conditions that have lowered tire mileages are listed by the Association as follows: (1) Higher speed engines that permit greater speed of the car; (2) Increased traffic, necessitating more stops and starts; (3) Improved acceleration, tending toward tire abuse; (4) More powerful brakes that are responsible for grinding off treads; (5) Smaller diameter wheels, necessitating more frequent road contact for tires; and (6) Improved roads, permitting higher average speeds.

Statement of the Association

In explanation of the effect of these changes, the A.A.A. says:

"It is estimated that the average speed on the open road, is from ten to fifteen miles an hour higher than two years ago. At continued high speed tire slippage is much greater, due to swerving and axle bounce resulting from road inequalities. Therefore it is important for tire users to realize that tire mileage is decreased as the speed is increased.

"Steady increase in the number of cars registered has also had a telling effect and has resulted in greatly congested streets, with a resultant gain in the number of starts and stops, as signals and traffic lights are obeyed.

"Acceleration quickly from a halted or slow-moving position is another evil that greatly affects tire mileage, as it results in the sliding of wheels. A car driven at the rate of thirty-five miles an hour and stopped every quarter mile will wear out half the tire tread in a distance of 100 miles.

"High-powered brakes, such as the four-wheel brake and the vastly improved two-wheel brake, bring a car to a stop in such a manner that if the brakes are improperly applied a thin coating of rubber is left on the street.

"Demand for higher speed with greater safety has brought about lower centers of gravity. This has been accomplished by the use of smaller-diameter wheels. It is simple logic that smaller wheels revolve more frequently and the tire tread is brought into contact with the pavement more than larger wheels. The small diameter wheels have more action as they make and break contact with the road.

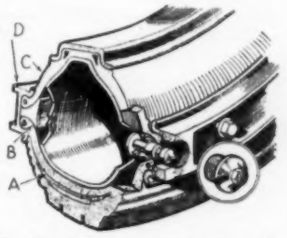
"The advent of the balloon tire has made proper inflation an item of paramount importance. In the day of the high-pressure tire the sole was stiffer and ample leeway was allowed by the manufacturer for those failing to keep them at the proper pressure. Underinflation or overinflation of the modern tire has a telling effect in decreasing the mileage."

The Association does not question that higher quality than ever is being built into tires but points out that the full mileage can be gotten out only through maintaining correct inflation, using judgment in starting and stopping and keeping wheels properly aligned.

One of the Akron tire manufacturers, who has noted the increase in tire consumption per car per years, has issued a statement dealing with the situation but he is more inclined to blame the production of cheap and second line tires more than the changed driving conditions, although he admits the influence of the latter. His suggestion is for every manufacturer to produce only tires of the highest quality at all times.

Invents Detachable Tread

THE British press recently has given considerable space to describing a new invention for a tire with a detachable tread which has been patented by Fred Rapson, the 16-year old son of Lionel Rapson, of the North



British Rapson Company, Ltd. The young man is said to have conceived the idea and brought the thought to the attention of his father, who assisted him in perfecting the plans.

The chief features in the new invention comprise a detachable tread and a bead section which are joined at the side of the tire by a clamp rim so that when the tread has become so badly worn as to be unserviceable a new tread may be substituted without the necessity for discarding the whole casing. Experiments with the new idea are still going on and if proven successful, the new tire will be offered to the public shortly.

Safety in the Cement Mixing Room

The Rubber Section of the National Safety Council in its news-letter for March calls attention to the fact that this is the time of the year when special attention should be given to rubber cement mixing rooms, or to any rooms where cements and solvents are used extensively, in order that the relative humidity of such places may be maintained at 40 per cent or higher. The maintainence of such humidity conditions is said by the Section to be the best way to prevent fires on account of static sparks. A relative humidity reading should be made at least once every eight hours and steam should be introduced into the room, or humidifiers installed, to eliminate the static hazard.

Value of the Rubber Hydrocarbon in Reclaimed Rubber[1]

When Compounded in Large Percentages, the Value of Reclaimed Rubber Hydrocarbon Runs Up to 50% of the Value of New Rubber

By W. W. Vogt,
The Goodyear Tire & Rubber Co., Akron, O.

Abstract

Tire-tread stocks containing reclaim were so compounded that their ultimate composition was the same except for the percentage of reclaimed-rubber hydrocarbon substituted for new-rubber hydrocarbon. Cures were adjusted to give the technical optimum in the same time of cure. The cured stocks were subjected to tensile and abrasion tests by five methods. The results show that the value of the reclaimed-rubber hydrocarbon varies from zero, when substituted in small percentages, up to a maximum of 50 per cent of the value of new rubber, when compounded in large percentages.

IN ORDER to determine the value of hydrocarbon present in reclaimed rubber compared with that in new rubber, it is necessary to compound the stocks in such manner that the percentage and kind of fillers, softeners, etc., are constant, the only variable being the percentage of the total rubber hydrocarbon which has been introduced in the form of reclaimed hydrocarbon. It is also necessary to adjust curing ratios in such fashion as to compensate for the accelerating or activating effects of the reclaim, so that all stocks reach technical best cure in the same length of curing time.

Experimental

Composition and Properties of Reclaim—The reclaim used was a typical high-grade, alkali-process, whole-tire reclaim having the following characteristics:

	Per cent
Acetone extract	10.4
Total sulfur	3.0
Free sulfur	0.08
Free carbon	7.5
Ash	19.3 (ZnO, 10.5, insoluble, 8.8)
Specific gravity	1.23

When cured in a formula consisting of 100 parts reclaim and 5 parts sulfur for 18 minutes at 2.8 kg. per sq. cm. (40 pounds) steam pressure (141.5° C.), it gave a tensile of 55 kg. per sq. cm. (800 lbs./sq. in.) and an elongation of 450 per cent.

The insoluble matter was assumed to be 50 per cent clay and 50 per cent barytes. The acetone extract was assumed to be 50 per cent mineral rubber and 50 per cent thin pine tar. The hydrocarbon content of the reclaim was figured at 55 per cent.*

Method of Compounding—The lowest grade compound was designed to contain 40 parts of new rubber hydrocarbon and 60 parts of reclaimed hydrocarbon and therefore the rubber base would be 40 of new rubber and 108 of reclaim (= 60 of hydrocarbon). As a result 108 parts of reclaim would contain:

108 × 10.4 per cent = 11.2 parts acetone extract (5.6 mineral rubber, 5.6 thin pine tar)
108 × 7.5 per cent = 8.1 parts carbon black
108 × 10.5 per cent = 11.3 parts ZnO
108 × 8.8 per cent = 9.5 parts insoluble (4.8 clay, 4.7 barytes)

Hence, these quantities of the various fillers and softeners will be unavoidably introduced in the lowest grade compound. The base compound containing all new rubber must then be made to contain these additions, in order to secure constancy of composition over the series.

It was known that the accelerating or activating effect of the reclaim could be duplicated by adding a small amount of litharge to the new-rubber base stock, so 0.5 part of the rubber was added to the base stock and this amount decreased in successive formulas as reclaim was added. This expedient gives a practically uniform rate of cure throughout the series. The complete formulas are given in Table I.

Table I—Stock Formulas

Stock	1	2	3	4	5	6	7
% Reclaim hydrocarbon	0	5	10	20	30	45	60
Pale crepe	100	95.0	90.0	80.0	70.0	55.0	40.0
Reclaim	0	9.0	18.0	36.0	54.0	81.0	108.0
ZnO	16.5	15.5	14.6	12.7	10.8	8.0	5.0
Gas black	43.0	42.3	41.6	40.3	39.0	36.9	35.0
Clay	4.8	4.6	4.4	3.2	2.4	1.2	0.0
Barytes	4.7	4.5	4.3	3.1	2.3	1.1	0.0
Mineral rubber	5.6	5.1	4.6	3.7	2.8	1.4	0.0
Pine tar	5.6	5.1	4.6	3.7	2.8	1.4	0.0
Litharge	0.5	0.45	0.4	0.32	0.23	0.1	0.0
Stearic acid	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Sulfur	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Captax	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total	189.2	190.05	191.0	191.52	192.83	194.6	196.5

These stocks were milled in about 4-kg. batches on a 50-cm. (20-inch) laboratory mill. The mineral rubber was added to the new rubber. The gas black and the accelerator were added in the form of a master batch. The new rubber containing the mineral rubber, the gas black master batch, and the separately broken-down reclaim were blended together and the rest of the ingredients added to the batch. Further compounds were made up in the following manner: New batches of stocks 1, 6, and 7 were milled and with the excess stock of the remaining batches were combined in such proportions by weight as to duplicate the chemical composition of stocks 1 to 7 (Table II). By so doing it was thought that some light might be cast on the question as to whether the law of mixtures was obeyed.

The results of this series confirmed those of the first series so exactly that it was concluded that the law of mixtures holds.

Table II—Composition of Mixed Stocks

Stock	21	22	23	26	24	28	25	29	30
% Reclaim hydrocarbon	0	5	10	10	20	20	30	45	60
Stock 1	1	1	1	2	2		1		
2									
3		1				1			
4			1						
5				1		1			
6								1	
7					1		1		1

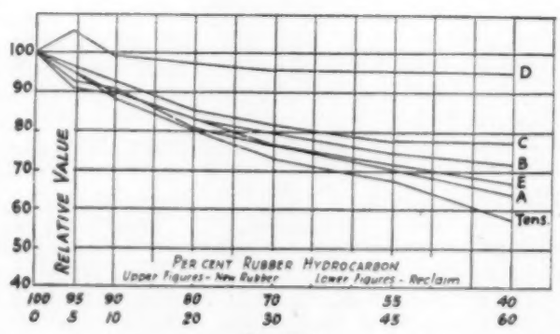


Figure 1

Testing Procedure—Standard procedures for physical testing were followed throughout, with care to give all stocks similar

[1]This paper was read before the Rubber Division of the American Chemical Society at its meeting in Detroit, September 5 to 10, 1927, where it was received as an important part of the Division's reclaimed rubber symposium. It is reprinted by courtesy of *Industrial and Engineering Chemistry*.

**Note*—These assumptions are in line with general experience with this type of reclaim. Furthermore, the exact ratio of clay to barytes makes very little difference in the ultimate physical properties of the compounds inasmuch as neither contributes any marked qualities to the final rubber compounds. The same may be said of the acetone extract. Outside of effects on the rate of cure, which have been compensated for in another manner, the type of softener assumed is unimportant. The rather high percentage of pine tar assumed was based on the knowledge that some of this material was used in the reclaiming process.

treatment. A range of cure from 30 to 90 minutes at 126° C. (258° F.) was obtained and the tensiles were practically identical over this range for all stocks. Hence the results on tensile are quite independent of cure. The abrasion results were obtained on the 60-minute cure for all stocks. This was judged to be the technical optimum.

All the data given are the average results secured from at least two, and in some cases three, batches of each stock, involving separate sets of cures. The tensile data are the average of all cures in the flat part of the curing curve, so that each point in Figure 1 represents at least two batches of four cures of three strips (two highest), or twenty-four separate tensile determinations. The abrasion data represent at least two batches of one cure of two test pieces on each type of machine. Since the conditions were so varied on the different types of abrasion machines, the data are presented in a comparative manner using stock 1 as a standard.

Tensile Strength and Other Physical Tests

The values for tensile strength for all the stocks are given in Table III.

TABLE III—TENSILE STRENGTH OF VARIOUS STOCKS

Per cent reclaim hydrocarbon	0	5	10	20	30	45	60
Per cent new-rubber hydrocarbon	100	95	90	80	70	55	40
	Kilograms per square centimeter						
Stocks	1	2	3	4	5	6	7
	21	22	23	24	25	29	30
			26	28			
Tensile	290	275	255	230	210	195	170
	280	270	255	230	220	200	175
			255	235			
Average tensile	285	272	255	232	215	197	172
Tensile as per cent of stock 1	100	95.5	89.5	81.5	75.5	69	60

The results are shown graphically in Figure 1, as is also the relative abrasion resistance by methods *A* to *E* as shown in Table V. Further data on the stress-strain properties of the best cure (60 minutes at 126° C.) of the stocks are given in Table IV, together with other data as to hardness, etc. The mechanical efficiency was obtained on small blocks of rubber by means of a pendulum rebound machine. At the same time the penetration of the pendulum hammer into the rubber was measured to 0.001 inch (0.025 mm.) and the reciprocal of this deflection is termed the "dynamic hardness."

It will be noted that as the percentage of reclaim hydrocarbon is increased the modulus at the low elongation (200 per cent) increases, while at the high elongation (500 per cent) it decreases. This corresponds to a rotation of the stress-strain curves about a point of constant modulus (about 400 per cent). Stocks containing reclaim are stiffer than, equal to, or softer than the equivalent stock compounded from new rubber depending on which point of the stress-strain curve is used as a basis for comparison. In other words, reclaim stocks have a lower stiffness index figure according to Dinsmore or a higher type figure according to Schidrowitz. Both writers agree that either a lower stiffness index or a higher type means an inferior product.

Abrasion Results

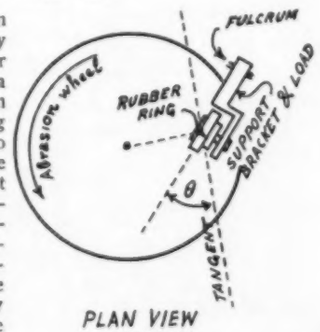
All the methods, with the exception of that one using Williams' machine[1] (Grasselli abrader), made use of test specimens in the form of annular rings of the following dimensions: o. d., 87.5 mm. (3.5 inches); i. d., 50.0 mm. (2.0 inches); thickness, 17.5 mm. (0.68 inch). The periphery of the ring makes contact with the abrasive surface under suitable conditions of slip. The abrasive surface in all cases was a 36-grain alundum wheel.

METHOD A (FIGURE 2*A*)—The ring is set perpendicular to the abrasive surface and at an angle with respect to the tangent of the abrasive wheel which passes through the center of the area of contact of the rubber ring and the abrasive. The abrasive wheel is driven by the motor.

Conditions:

Angle (Θ)	16 degrees
Load applied on rubber ring	14.5 kg. (32 lbs.)
R. p. m. of abrasive wheel	80
Surface speed of abrasive wheel at center of area of contact with rubber ring	137 meters (450 feet) per minute
R. p. m. of rubber ring	About 500

METHOD B (Figure 2*B*)—An abrasive wheel is mounted coaxially with a heavy flywheel. The rubber ring is mounted on the shaft of a constant-speed motor, which is in turn mounted on a freely moving carriage. A weight is used to press the rubber ring against the periphery of the abrasive wheel. It will be appreciated that the flywheel system has a constant moment of interia and that if the rotating rubber ring is placed in contact with the stationary abrasive wheel slippage, and consequently abrasion, will take place until the abrasive wheel is running at the same surface speed as the rubber ring. Furthermore, a definite amount of energy must be supplied to the flywheel system to bring it to this condition. As a result a certain amount of rubber will be abraded while a definite quantity of energy has been *transmitted through* the rubber ring to the flywheel system. The loss per cycle is taken as the unit of measurement. The principle of this machine was suggested by A. M. Hamblet.

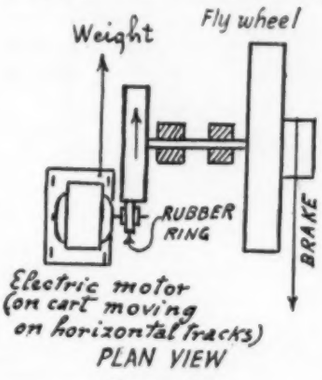


PLAN VIEW
Figure 2A

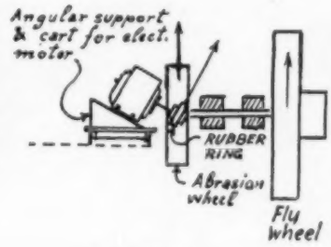
Conditions:

R. p. m. of rubber ring	1780
R. p. m. of abrasive wheel	0 to 515
Surface speed of rubber ring	450 meters (1625 feet) per min.
Surface speed of abrasive wheel	0 to 495 meters (0 to 1625 feet) per minute
Load applied	2.27 kg. (5 lbs.)

METHOD C (Figure 2*C*)—The same set-up is used as in method B. A tachometer is mounted on the flywheel shaft and when the system is running at maximum speed a strap brake is applied to the flywheel to cut down its speed any given amount. Since the rubber ring is maintained at constant speed, a certain differential slip is set up and abrasion ensues. The test is continued for a given length of time, and from the value of loss so obtained is subtracted the loss due to one cycle (of method B).



PLAN VIEW
Figure 2B & C



SIDE VIEW
Figure 2D

The general conditions were the same as in method B. The slip was caluculated as the reduction in r. p. m. of the abrasive wheel divided by the maximum r. p. m. of the abrasive wheel times 100. The value used in the present experiments was 30 per cent, corresponding to a surface slip of about 150 meters (500 feet) per minute.

METHOD D (Figure 2*D*)—The rotating rubber ring is pressed against the abrasive wheel, but the plane of the rubber ring makes an angle (Θ) with the plane of the abrasive wheel. This sets up a slippage with consequent abrasions.

Conditions:

Angle Θ	20 degrees
Load on rubber ring	2.27 kg. (5 lbs.)
R. p. m. of rubber ring	1780
Surface speed of rubber ring	495 meters (1625 feet) per minute
Surface speed of abrasive wheel	1625 $\times$ cos Θ = 465 meters (1530 feet) per minute
Maximum r. p. m. of abrasive wheel	485
Slip	1625 $\times$ sin Θ = 170 meters (555 feet) per minute

The test is conducted for a given length of time and no correction is made for the abrasion which takes place during the period in which the abrasive wheel is attaining its maximum speed.

METHOD E—The Grasselli abrader (Williams' machine) is used according to the standard conditions recommended by Williams:[1] load, 3.64 kg. (8 lbs); time, 20 minutes.

The results are figured on the basis of cubic centimeters per horsepower-hour. All these methods gave duplicable results, and seldom was the maximum variation as much as 5 per cent. The mean variation was 2 to 3 per cent.

TABLE V—ABRASION RESISTANCE (FIGURE 1)

STOCK	NEW-RUBBER HYDROCARBON	RECLAIM HYDROCARBON	METHOD A	B	C	D	E
1, 21	100	0	100	100	100	100	100
2, 22	95	5	93	95	96	106	91
3, 23, 26	90	10	91.0	90	92	99	89
4, 24, 28	80	20	81.0	83	85	97	83
5, 25	70	30	77.0	..	82	96	77
6, 29	55	45	71.0	75	77	95	72
7, 30	40	60	65.0	72	77	95	67

A summary of the averages of all stocks 1 to 7 and 21 to 30 by the various methods is given in Table V, wherein the values given are for abrasion resistance with the all new-rubber stock 1 assigned an arbitrary value of 100. Values less than 100 indicate inferior wearing stocks. Method D gives results which show that

1 *Ind. Eng. Chem.*, 19, 674 (1927).

TABLE IV—PHYSICAL PROPERTIES OF STOCKS

Stock	Reclaim Hydrocarbon %	Modulus 200%	300%	400%	500%	Av. Tensile	Elongation	Shore Hardness	Dynamic Hardness	Mechanical Efficiency
		Kg. per sq. cm.				Kg. per sq. cm.	%			%
1	0	47	85	135	198	285	625	70	4.38	63.1
2	5	51	88	140	195	272	600	71	4.62	64.2
3	10	48	85	132	190	255	595	72	4.80	60.0
4	20	52	86	134	186	232	580	71	5.02	57.0
5	30	52	88	132	182	215	560	71	5.02	56.5
6	45	57	93	134	178	197	540	72	5.02	58.0
7	60	57	93	131	172	172	500	71	4.95	59.0

all stocks are virtually the same. Since the only property which is approximately constant for all stocks is their hardness, it might be inferred that this method measures hardness almost exclusively. The other methods, particularly A and E, agree very well.

Interpretation of Results

Both the tensile and the abrasion-resistance figures indicate clearly that for additions up to 20 per cent of reclaim hydrocarbon no value is obtained from the reclaim hydrocarbon. Above this point the reclaim hydrocarbon shows a positive value. The following analysis is an attempt to evaluate the reclaim hydrocarbon in terms of new-rubber hydrocarbon:

Let A = value of abrasion resistance or tensile strength of new-rubber hydrocarbon, and let it be assigned a value of 100 units

B = value of reclaim hydrocarbon in the same units

C = experimentally determined values for abrasion resistance or tensile strength (based on new-rubber stock = 100) of various stocks

Y = amount of new-rubber hydrocarbon as a decimal fraction and $1.00 - Y$ = amount of reclaim hydrocarbon as a decimal fraction

Then $Ay + B\ (1.00 - y) = C$ on the assumption that the qualities of the two types of hydrocarbon are additive.

Solving for $B = \dfrac{C - Ay}{1.00 - y}$

The B value is the intercept on the vertical axis in Figure 1 at the 100 per cent reclaim point of a line drawn from the 100-unit point on the vertical axis through any experimental point on the various curves. Taking the values of C for tensile strength from Table III and the values for abrasion resistance from Table V and solving for B we get the figures given in Table VI.

These values apply to the particular methods of testing used and to the particular stocks employed, and since the value changes with the amount of reclaim hydrocarbon substituted for new-rubber hydrocarbon, it is not capable of general application. The method of evaluation might, however, be profitably extended to various types of compounds and to various methods of testing.

TABLE VI—VALUES OF RECLAIM HYDROCARBON

New-Rubber Hydrocarbon %	Reclaim Hydrocarbon %	From Tensile Strength	From Abrasion Resistance by Methods A	B	C	D	E
100	0	..	..	..	..	..	..
95	5	0	Neg.	0	20	220 (?)	Neg.
90	10	Neg.	1	0	20	90	Neg.
80	20	0	5	15	25	85	15
70	30	10	23	..	40	86	23
55	45	27	35	45	49	89	38
40	60	30	42	33	62	92	37

These results might be construed to mean that reclaim is worthless when used in small amounts in high-grade tread compounds. This is by no means a fact. They do mean, however, that a method of compounding which substitutes reclaimed hydrocarbon for new-rubber hydrocarbon without other changes and adjustments in the formula may give adverse results.

Holt and Wormeley[2] published results of road tests and laboratory abrasion tests on tire treads containing reclaim. The writer has recalculated the composition of the compounds listed by them (page 580) on the same basis as used in the present paper and on the assumption that the reclaim used had the same analysis as that used here. Table VII gives some comparisons.

TABLE VII—COMPARISON OF LABORATORY AND ROAD TESTS

Stock	1A	1B	1C	1D
Per cent new-rubber hydrocarbon	100	90.4	82.7	76
Per cent reclaim hydrocarbon	0	9.6	17.3	24
Parts carbon black per 100 total hydrocarbon	26.2	28.2	30.0	31.2
Parts ZnO per 100 total hydrocarbon	20.5	21.4	78.0	15.5
Road-wear index	100	85	80	73
B value		Neg.	Neg.	Neg.

In spite of the fact that the substitution of new-rubber hydrocarbon by reclaimed-rubber hydrocarbon is accompanied by an increase in the percentage of carbon black (the main re-enforcing pigment), the wear resistance drops off faster than the percentage of new-rubber hydrocarbon, thus giving negative values for the reclaim hydrocarbon. These results confirm in the main the conclusions of the present paper.

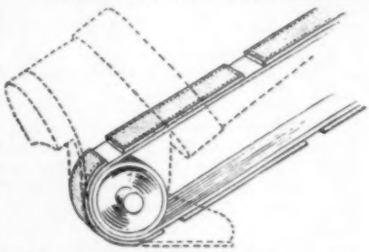
2 *Bur. Standards, Tech. Paper* 294.

Acknowledgment

The writer wishes to express his appreciation to R. P. Dinsmore for valuable suggestions and criticism.

Rubber Sole Flexing Test

A RELIABLE and thorough flexing test for their rubber soles is believed by the Essex Rubber Company, Trenton, N. J., to have had much to do with their success in manufacturing such goods. The nature of the test is clearly shown in the accompanying sketch. Various soles are stitched to a belt and run over pulleys. Each revolution subjects the soles to two flexings. These flexings are recorded and the number required to distress each material is noted. When the sole is bent as it passes around the pulley it occupies approximately the same position as it does on a shoe when the wearer is stepping forward. This is shown by the dotted lines in the sketch. This test quickly reveals defects, or superiority, in a sole.



Canadian Rubber Statistics for 1927

CANADA showed an increase of approximately 6,000 tons of crude rubber imports during 1927 over the preceding year. A total of 26,404 tons were imported in 1927 as against 20,253 tons in 1926. Because of the drop in the market value of crude rubber, however, the total import value of the arrivals was $2,340,000 less last year than in 1926.

This increased consumption of crude rubber in the Canadian manufacturing industry is reflected somewhat in the drop in importations in various rubber manufactured goods, principally belting and pneumatic and solid tires. It is also accounted for in the increased exports of rubber manufactured goods from Canada, particularly in the shipment of tires and inner tubes. Exports of solid tires increased from 9,711 tires in 1926 to 14,473 tires in 1927. The principal increase was made in pneumatic tires, however. The total number of pneumatic casings exported during 1927 was 1,679,126 against 1,152,070 in 1926. Exports of inner tubes during the year just past were 1,796,619 tubes as against 1,135,948 tubes in 1926.

Aging Qualities of D. P. G.

TESTS conducted over a period of years have proven, despite impressions to the contrary, that D.P.G. is a good ager according to the Dovan Chemical Company, New York City. The results of the tests made by factory chemists and Dovan technical men show that compounds accelerated with D.P.G. age extremely well, especially when the proportion of sulphur to rubber is proper. Although it is recommended to use not over 3.5 to 4 parts of sulphur, stocks containing 6 to 7 parts sulphur have shown excellent resistance to oxidation.

[PART 3]

Exploring for RUBBER *in* MEXICO

Revolutionary Activities Disrupt Plans for Exploitation of Chilte; Other Important Growths Inspected

By GEORGE F. WEEKS

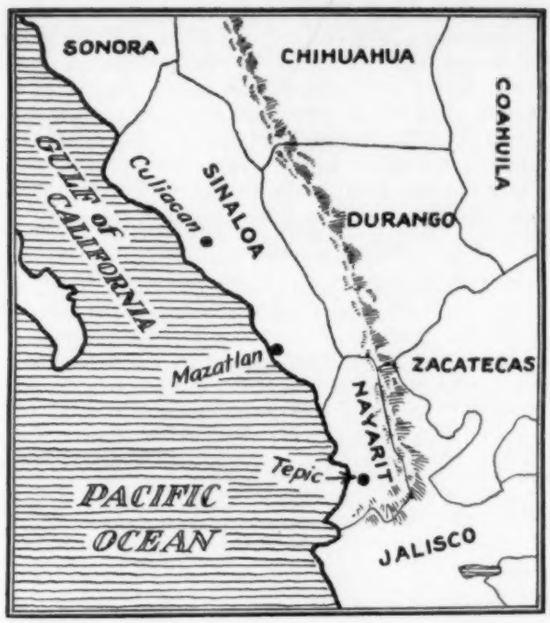
III

IT was then sought to interest an American rubber concern, and the whole matter was laid before its representatives in detail, with all the information that had been gained. After some delay the proposition was turned down. Months later I learned by accident from a person connected with that company and in a position to know of my action and of the proceedings of the concern, that after my plan had apparently been discarded, the information was made use of, several tons of the Chilte gum were obtained, and it was used in combination with the higher priced rubber for a number of purposes and with complete success. This, of course, was "strictly business!" The revolutionary activities which reached an acute stage not long afterwards, led to the abandonment of any further effort in this direction, such abandonment being encouraged, doubtless, by the subsequent decrease in the price of plantation rubber to a hitherto unheard of figure.

Among other correspondents who were negotiated with in the search for the necessary backing in order to engage in the production of the gum on a large scale was a German firm in Hamburg. Samples were sent them and after testing they offered to take an unlimited amount of the product, if, like the samples, it was entirely free from extraneous impurities, and to pay therefor the equivalent of fifty cents gold per pound. It was gathered from the correspondence that certain uses were to be made of the material in its crude condition, if perfectly pure, and without requiring to be refined or deresinated.

After the subsidence of the revolutionary troubles, at the end of several years, it was learned upon inquiry that various foreign agencies had sought to engage in the enterprise. But their representatives were so unacquainted with the country and its people, their methods were so liberal in the direction of supervision costs in proportion to the actual amount of Chilte obtained, and the price of rubber had reached so low a figure, that their principals had become discouraged and abandoned the enterprise.

The proper method for engaging in this business is to contract with responsible local parties, either owning land



themselves or who can lease such lands, to extract and prepare the product for a certain fixed price per kilogram or arroba. No expensive exploration parties, no high-priced office staff or equipment are necessary. A competent and reliable shipping agent, with knowledge of the language and customs of the country, is all that is needed, and such a person can cover a wide territory. With such arrangement, there is no reason why the extraction and marketing of Chilte gum should not be made an extensive and profitable business when rubber prices are fairly high.

The names of several such parties have at different times been obtained by the writer and correspondence had with them, upon which the foregoing conclusions are based.

Prof. Allen's Report on Palo Colorado

Palo Colorado was investigated a few years subsequent to the writer's visit by Professor John R. Allen, of the University of Michigan. In his report the following paragraphs appear:

"Wherever the eyes rested in this great vastness (a point on the western slope of the Sierra Madre in the State of Durango) was seen the tree, which was easily identified from the descriptions and the reports previously submitted. For instance, the quickest but by no means the pleasantest way of ascertaining whether or not the right tree was being investigated was by touching its leaves, which burned the flesh like a red-hot iron. The Palo Colorado has the appearance of a horse-chestnut which bears a fruit in the form of a nut. The tree, belonging to the nettle family, which is one of the prominent families of rubber bearing trees, occurs along the mountain sides and particularly along the water courses. The size of the trees varies from a few inches in diameter to twenty inches and they increase in size as the elevation decreases. The party estimated from 25 to 30 trees to the acre, which is considered a conservative calculation.

"Being convinced that the tree abounded in the greatest profusion, they made experiments in the tapping of the same, which was done by having the natives cut a V-shaped channel two or three feet long into the bark and diagonal knife-blade cuts through the bark connecting with this channel. The milk immediately oozes out of these cuts and runs down the trunk of the tree. The rubber is usually collected in a hole in the ground or in a tin pan, the pan being preferred. The milk comes out creamy white and

the frequent tapping does not prove injurious to the tree[1]. The Palo Colorado gives milk in good quantities, as was proved to the party's satisfaction before leaving the property. Each tree averaging in size about six inches in diameter will yield about two kilos, or five pounds, of gum per tapping. This result is obtained by tapping the tree for three consecutive times, every five days. After the third tapping the tree is allowed to recuperate for about four months, when the same operation is repeated."

The Palo Amarillo or Yellow Tree

Another growth encountered on the writer's journey on the rocky western slopes of the Sierra Madre is known locally as the Palo Amarillo, or yellow tree, from the color of its bark. This has been classified by botanists as belonging to the Euphorbia family. Because of its chemical constituents, the latex requires special treatment for the separation of the rubber. It can be propagated with ease from cuttings and at five years of growth is said to be ready for tapping. There are extensive areas of the tree in Durango and Sinaloa and near Tepic, and possibly farther south.

A heavily capitalized company was organized in Mexico shortly before the commencement of the revolutionary era by a foreign capitalist for the expolitation of the Palo Amarillo, and some rubber was reported to have been produced. But the death of the promoter and the disturbed political conditions of the past few years left the field unoccupied, though it appeared to be of considerable promise.

The late Dr. Pehr Olson-Seffer, an agricultural and rubber expert, classified the Palo Amarillo as *Euphorbia Fulva,* and from his report thereon the following is taken:

"The tree grows to a height of between 20 and 34 feet, with a trunk diameter of from 7 to 12 inches. In the inner bark of the stem and its branches occur numerous latex bearing vessels containing a semi-liquid fluid of milky whiteness which solidifies upon contact with the air. Chemical examination of this latex shows that it contains from 7.3 to 15.7 per cent. of rubber, and from 19 per cent upwards of resins. The coagulation of the latex is not easy, though it can be accomplished."

Cryptostegia Grandiflora

In various localities from Tamazula, on the border of the State of Durango, to Tepic, a vine was encountered called by the natives "Solda con Solda," (also "Suelda con Suelda"), whose latex was decidedly "gomoso," or rubber bearing. Later it was learned on the authority of Dr. Charles S. Dolley of Mexico City, who was by way of being a botanical expert, that the technical name of the growth is *Cryptostegia Grandiflora,* known locally as Clavel de España, and also as Clavel de Aleman. Through his efforts an investigation was made by the State Government of Sinaloa with regard to the possible value of the growth in rubber production, which resulted in an official report from which the following is taken:

"The most important points about this plant are: The facility with which it propagates—the seed fall on the ground, germinate, and serve to spread the plant without aid; the rapidity with which it grows, reaching in a year a height of from one to two meters (39 to 78 inches), according to the quality of the soil; its power to resist injury by the drying up of the soil, which, no matter how severe the drought, fails to kill it, the plant remaining continually green even in the driest lands; finally, its power of supporting severe trimming or cutting back, which it does not seem to resent in the least, on the contrary after this operation, it sprouts with extraordinary vigor and grows anew.

"There are lands about Rosario (in Southern Sinaloa) in which the plant has made such extraordinary growth as to invade the fields completely and is regarded by the farmers as a plague, owing to the frequency with which the fields must be cleaned and the impossibility of extirpating it; for, as already remarked, cutting only serves to make it grow more vigorously.

"A sample of the stems and leaves sent to California was treated with magnificent results, obtaining a pure rubber of the best quality."

Cryptostegia has been grown in Florida as an ornamental plant, and there seems no good reason why it could not be cultivated in portions of the Southwest where frost is of seldom occurrence. Experiments looking to its cultivation in that region are understood to have been undertaken by the United States Department of Agriculture and by Thomas A. Edison, the inventor.

Other Latex Bearing Growths

Many other latex bearing growths not separately discussed in this report were found in the states of Durango and Sinaloa. As a summary to cover the explorations in those states the following list is given. The confusion of names locally may be responsible for the inclusion of some that will ultimately prove to be not distinct from others. The ones believed to be of chief value have been separately discussed. The list is as follows, showing both plants and the centers near which they were observed:

GROWTHS FOUND IN THE STATES OF DURANGO AND SINALOA, CONTAINING LATEX

Haba—at Noria and Tepusta.
Chicater—at Rosario and Mazatlan. (Chilte and Chicate.)
Ysa—at Tamazula.
Palo Blanco—at Culiacan and elsewhere in abundance.
Zalate—at Lose Mayos and vicinity.
Higueras—at San Ygnacio and Labor.
Chipil, or Camuchin—at San Ygnacio and Labor.
Capule—at Hacienda de Chiele.
Mora—at El Boleo and San Juan.
Cacalasouchil—at La Joya and Caballos.
Regalgar—at Mesillas and Espinal.
Texcalama—at Sangrelindo, Cosala.
Algodoncillo, or Palo Malo—at San Jose de Bacis.
Candelilla Prieta—at Oso, Santa Rosa, Pericos, etc.
Tapaco or Berraco— at Hilama.
Solda con Solda—at Mazatlan and Noria. (Also Suelda con Suelda.)
Lacrima de Virgin—at Mazatlan, Rosario, etc.
Talayote—at Badiguarato.
Guaco—at Placa Colorado.
Chutama—at Sinaloa and Fuerte.
Copal, or Copale de la Virgen—at Sitio and San Benito.
Jictillo, also Papalillo—at Sitio and San Benito.
Cedro—at Amaculi, Durango.
Chilte—at Acaponeta, Tepic, etc.
Clavel de España—at Rosario, etc.
Bebelama—in Eastern Sinaloa.

Since the investigation herein reported upon was completed, the writer has kept in touch with many of the local authorities and residents of the territories visited who are in a position to report further on the matter of rubber production or who might be induced to engage in it. As previously conceded, the exploitation of these growths does not appear imminent but they are nevertheless of great potential value, particularily to the United States. Any sudden increase in the price of rubber, arising from any cause, will undoubtedly call for a reappraisal of the rubber sources most conveniently at hand. It is not at all inconceivable that the tonnage of chilte, for instance, eventually entering the United States will be of considerable importance.

(*Editor's Note: This is the third and concluding installment of Mr. Week's report on his two-year survey of rubber producing plants of western Mexico. The previous installments appeared in the issues of February* 10 *and February* 25.)

[1]Other authorities have offered evidence that frequent tapping often results in the death of the tree. Editor.

Some Factors in Current Practice in RUBBER SOLING

By Constant and Notable Improvement of Its Products, the Rubber Soling Industry Has Been Able to Hold a Place in the Footwear Field to Which It Fell Heir When the World War Sent Leather Prices to High Levels

OWING to the high price of leather during the war period there was a trend for the rubber sole to replace leather on many types of shoes. The sole produced at that time was known as the fiber sole and proved in most cases to be a poor substitute for leather. As a result, it died a natural death as soon as things became normal again. From that development, however, came the molded rubber sole which has attained a definite place in the leather shoe line and has had a steady market. Large producers of leather shoes now maintain their own rubber plants to take care of their sole and heel requirements.

The carbon black sole is used largely on men's work shoes of the heavy type. Various colored sport soles with corrugations and cups of different designs are used on golf and general sport shoes. Lighter weight tan soles find wide use on misses' and children's play shoes.

Manufacture of Carbon Black Soles

The carbon black sole, which is noted for its long wearing qualities, is made from a compound containing up to 15 per cent of carbon black and a high mineral rubber content. In the unvulcanized state it is very hard and requires particular attention on the mill and calendar to run properly. Current practice is to laminate the stock on a drum adjacent to the soling calender after which it is cut into sheets and booked for cutting. The sole blanks are died out on a single clicking machine after the stock has been gauged to see that it comes within the gauge tolerance for the particular "iron" of the finished sole. An "iron" is approximately 20/1000 of an inch, and black soles are made in 7, 9, 10, and 14 irons.

In molding the soles, for first class results it is essential that the hydraulic and press equipment should be in first class shape to insure an even, constant pressure. Molds should also be checked constantly to see that the depth of the cavities is uniform. On a 14-minute cure at 83½ lbs. pressure and 326 degrees Fahrenheit, the pressman is able to run five molds, four in the press, and one out for changing. This allows 3½ minutes to remove the mold, take out the cured soles, brush with mold solution or soap, load, and put back in the press.

After the soles are cured, they are allowed to cool, then the overflow is trimmed off, and they are inspected and packed. The percentage of overflow must be carefully watched as it is a vital factor in cost. Some of the up-to-date mills which make a business of watching gauges and controlling the size of blank according to latest engineering principles achieve overflow percentage as low as 3 per cent.

It is very important that rubber soles take stitching without cracking or tearing, and sole manufacturers are constantly working with the leather shoe plants to improve this quality.

In the tan sole, which is used mostly for misses' and children's play shoes, it is not possible to make as tough a sole on account of the absence of carbon black. A smaller percentage of mineral rubber is used, and red tube reclaim works in very well as part of the rubber base. With some tube reclaims it is possible to get the tan chocolate color without using red oxide, but usually it is advisable for the manufacturer to add his own oxide on account of compound control. Quality in the finished product dictates that only the highest quality red oxides should be used. A small percentage of anti-oxidant is very good insurance in molded soles. Tan soles are often made with a wedge heel in one piece, thus saving the leather shoe manufacturer the extra labor of heel attaching. The stock for this sole must be run with extra care to prevent blisters due to trapped air.

The Wearite sole, produced by the Essex Rubber Company of Trenton, is a good example of the successful, high-quality rubber composition soles being produced in the rubber industry today. During the past three years more than ten million pairs of Wearite soles have been sold with complete satisfaction to the wearers. These soles are molded to any thickness and shape desired and are used on all styles of shoes from infants' to men's. A large part of the success of the Wearite sole is attributed by the Essex Company to an effective flexing test which is described on another page of this issue.

While crepe soles for general wear are not as popular as they were a few years ago, they are still produced in good volume, some consumers preferring them for street and general wear. The early troubles of softness and spreading have been eliminated by proper selection of the latex sheets from which they are cut.

From these types of soling, we pass to another group, namely, the sole stocks made by the rubber footwear manufacturer as a part of his product and vulcanized with the shoe instead of separately. Here the compounder has an entirely new set of problems. The first is balance. He must produce a sole which will wear uniformly with the upper of the shoe. In light dress rubbers, it must be light weight but nevertheless durable. In men's heavy rubbers it must be heavier and tough to stand the severe test that such consumers as railway workers, teamsters and chauffeurs give it. Far basketball and tennis shoes he must produce a sole which has sufficient tack to cling to the smooth polished floor, at the same time resilient and tough

enough to stand the wear and tear of service. The medium and low grade tennis shoes are largely worn by youngsters who give the soles severe wear and this condition must be met in the compound.

Color is more of a factor here too. We have black soles on rubbers, heavy boots and arctics, and white soles on boots, heavy rubbers, and tennis shoes. We also have red and tan soles on fancy gaiters, grey soles on tennis and gaiters, and so on. High grade lithopone is a valuable ingredient in the colored stocks. White reclaim, when obtainable, is useful in white tennis soles.

Another condition which is present in this class of work but is not present in the molded sole is the embossing or engraving on the sole produced by the calender roll. This necessitates a uniform stock which will not shrink, and one which will run easily. This limits the grades of reclaim which can be used. For example, a black tire stock will not run as smooth as a shoe reclaim in footwear soling. Red tube reclaim which would be valuable in tan soles is not usable on account of this calendering condition.

Vulcanized crepe soles on rubber footwear are still popular and appear to eliminate the objectionable features of the unvulcanized crepe such as spreading and becoming soft. This type of sole is made from a compound containing a high percentage of pale crepe, zinc carbonate (which is unique among compounding materials for this purpose, being an excellent toughener and does not change the color), and a quick curing accelerator such as Z88 or Tuads. It is run through the calender without heat on the roll which gives it the crepe appearance, then laminated and cut either on a sole skiving machine or by die on a clicker. This sole is probably the most durable rubber sole ever made and predominates on high grade basketball shoes, and tennis oxfords for tennis playing.

10 YEARS AGO

Items Reprinted from the March 10, 1918, issue of THE RUBBER AGE

THE RUBBER ASSOCIATION OF AMERICA opens a branch office in the Colorado Building, Washington, D. C., to keep in close contact with government matters. . . .The annual statement of the United States Rubber Company for the year ended December 31, 1917, shows net sales of $176,159,000, an increase of more than $40,000,000 over the previous year. . . .B. F. Goodrich Company had the best year in its history, net earnings amounting to $12,675,000. F. C. Van Cleef was elected secretary of the company, succeeding Guy B. Norwood, who recently accepted the presidency of the Republic Rubber Company. . . .The government has served notice of further large needs in rubber footwear and the capacity of the factories will be taxed to the limit up to next June. . . .M. E. Mason, sales manager of the Mohawk Rubber Company, completes his twentieth year in the sales end of the tire business. . . .Census figures for 1914 just issued showed that there are 342 rubber factories in the United States employing 88,821 persons and producing rubber products valued at $300,993,796. . . . Converse Rubber Shoe Co., Malden, Mass., is selling the last of a $550,000 issue of 7% cumulative preferred stock. . . .The following plants are building additions to their factories: Essex Rubber Co., Trenton; Luzerne Rubber Co., Trenton; Federal Rubber Mfg. Co., Cudahy, Wis.; Hewitt Rubber Co., Buffalo; Home Rubber Co., Trenton. . . .New rubber factories being built at this time are: Armstrong Rubber Co., Garfield, N. J.; Doss Rubber Co., Atlanta, Ga.; Parker Tire & Rubber Co., Indianapolis; Standard Four Tire Co., Keokuk, Ia.; Century Rubber Co., Chicago; Akron Biltwell Tire & Rubber Co., Akron; Hanley Tire & Rubber Co., Newark, N. J. . . .Fisk Rubber Co. showed profits of $3,578,484 for 1917. . . .

Schaphorst's CHATS *with the* ENGINEER

By W. F. SCHAPHORST, M.E.

Boiler Tube Buckling

ENGINEERS operating boilers in rubber plants have observed that when the tubes in water tube boilers buckle, they usually buckle upward, while in fire tube boilers they buckle downward.

There are a number of good reasons why the tubes buckle in this way. In water tube boilers, the scale, if there is any, usually lodges on the bottom of the tubes and forms an insulation between the water and the source of heat. Consequently the lower side of the tube is overheated. The tubes that are higher up in the tube bank are not so hot, consequently they hold the boiler heads together, and as a result the overheated tube is in compression. This compressive force naturally causes the tubes to buckle upward because the lower side is the weaker side on account of its being so much hotter than the top side.

At the same time it must be remembered that the lower side of the tubes in a water tube boiler are hotter than the upper side because the heat comes from below and the lower surface of the bottom tube is in "full view" of the hot fire in the furnace.

On the other hand, in fire tube boilers the scale forms on the outside and on top of the tubes. Heat is most intense on top because heat always goes upward. Therefore, for reasons similar to that explained above, the tubes in fire tube boilers buckle downward. The top is weaker than the bottom.

Other things that doubtless have considerable influence in many boilers are soot and ash. In water tube boilers soot and ash have a tendency to settle on the tops of the tubes, thus giving us an insulating effect there. That is, the heat is kept away from the tops of the tubes. This increases the tendency to buckle upward, the soot being on the outside of the tube while the scale is inside, the soot keeping the heat away from the tube and the scale keeping the heat away from the water.

In fire tube boilers the soot is inside the tubes, at the bottom, and the scale adheres outside the tubes at the top. Hence the higher temperature attained by the tops of the tubes in fire tube boilers. This, it seems to me, covers the reasons pretty completely as to why boiler tubes buckle as they do. Not much room is left for argument.

20,000,000 *Automobiles*

Have you ever tried to visualize the full meaning of the 20,000,000 automobiles that we have in the United States?

The number "sounds" big, but if we should want to park all of the cars together, how much ground area would be required? Basing my figures on 90 sq. ft. of ground area per automobile I get 64.5 square miles as the size of the parking space. In other words, when arranged in the form of a square the solid mass of cars would be 8 miles by 8 miles.

To walk around the square one would have to walk 32 miles. At 4 miles per hour that would take 8 hours.

Arranged in the same mass formation on a road 100 feet wide, 17 cars abreast, the road would have to reach across the entire continent—from New York to Los Angeles—to accomodate all of the cars. That's the meaning of 20,000,000 automobiles.

THE GENTLEMAN FROM MINCING LANE
reports current opinion in London's famous rubber market in every issue of THE RUBBER AGE

The London Letter

This Week The Gentleman Talks About Playing Hob

LONDON, 27th February, 1928.

UNCERTAINTY plays hob with rubber more than is true of any other market. It is interesting to picture the course of events since the February 1st announcement of "no change in restriction." Traders in the Lane had settled down comfortably to enjoy another three months of certainty and had made their commitments, assured that X—the unknown as regards restriction—was safely over the next hilltop, and there was every expectation that a buying movement was about to break again. Suddenly a Cabinet investigation is announced, rubber prices and share prices drop, and there is a general hurrying-in out of the rain with furious language accompaniments.

The ten days that followed covered a period of fluctuations and uncertainty in the markets and rumors and counter-rumors. There were many questions asked, too. Why was this a Cabinet announcement and not one from the Colonial Office as heretofore? Why announce it at all? Why couldn't they make their investigation quietly? Some of the answers showed a measure of the heat generated by the sudden explosion and are not worth recording; others weren't polite.

The substantial Rubber Growers' Association has issued another announcement to the effect that they have during the past three months been conducting their own inquiry into the rubber position. Also they state that the Rubber Growers' Association was not informed of the intention to make rubber restriction the subject of a Government inquiry. The R. G. A. statement continues:

> "Any radical and hurried departure from existing conditions would be fraught with grave danger and serious loss to all concerned. The present scheme of restriction may be modified in details—after full consultation with those qualified to speak—but details are of less importance than a considered policy which, when decided upon, will govern the situation for an agreed term of years. That is the best course calculated to serve the interests of producers, manufacturers and users of rubber."

HERE again you have the demand for stability for "an agreed term of years." Of course, the storm centers on this point as is evident from the questions in Parliament. The rubber growing industry wants "an agreed term of years" to cover a satisfactory restriction scheme of some sort. Mr. Eric Miller, speaking at the United Serdang Meeting, claims that in view of the Government's announcement in October, "everyone was entitled to believe that no changes would be made in the restriction scheme prior to next October 31st, i. e., the end of the current restriction year." And he goes on with a strong indictment:

> "I am bound to say that in my opinion the credit of the British Government has not been enhanced by the manner in which action has been taken, and I deplore this more than anything. Why, when given the opportunity by question in the House, did Mr. Baldwin decline to name some reasonable period of time during which the rubber industry might be sure that the existing scheme would continue unaltered, whatever the nature of the Committee's report might be? As long as the industry is left in vague suspense there is a natural disposition for everyone to say: 'Let the inquiry of the Committee be speeded up.' Therein lies danger because the members of the Committee will probably know very little about the industry. Let the inquiry be unhurried, and let the whole of the facts be carefully studied. It will be difficult to secure a calm statement of the case while the industry is left in unsettling uncertainty, and the first essential is to give the industry immediate assurance that the existing scheme will continue in its present form until the end of the current restriction year—that is, until 31st October."

As the atmosphere cleared and the Lane still saw big January consumption figures from the U. S. A. and London rubber stocks still declining and continental cables suggested that the Dutch were inclined to be more amenable to reason, a more philosophic view prevailed.

FIGURED on the threepenny drop in rubber prices, Symington and Sinclair have estimated that the British losses on raw rubber amount to 1½ million sterling, to say nothing of the losses on rubber shares. But, of course, with rubber and rubber shares moving up and down, this is not the first time a drop of threepence has had to be taken into account, and such cuts are so promptly made up—and more than made up—as to preclude such extraordinary comment.

The fact seems to be that the Cabinet has simply become uneasy about the effects of restriction. The Government all along has declared restriction to be a temporary policy; they promised to do nothing before February 1st, and then to give ample notice that something might be done, that's all. They may decide on even more restriction than now prevails but no one has burst into print suggesting this.

Then again, there seems to have been much more opposition to the restriction scheme under cover than was realized. Letters to "The Times" from important companies who have not given much of an expression to their views before have a decided bite in them. There is a particularly strong feeling against the Dutch for not joining into the restriction scheme.

It is still very early to even guess what will be the outcome of it all. Nevertheless, several prophets have already appeared on the horizon. A writer in "The Statist" suggests three possible alternatives:

(1) Maintenance of British restriction alone.
(2) Restriction in moderation with co-operation of Dutch producers (European and native).
(3) Gradual removal of British restriction.

The view generally held is that the third is the most likely to be the outcome—possibly with a gradual reduction in pivotal prices from the present level of 1/9d down to 1/6d, 1/3d and maybe even to 1/- in preparation for final removal of all restrictions.

Yours faithfully,
THE GENTLEMAN FROM MINCING LANE.

Modernize Your Core Equipment

With the New BRIDGWATER LIGHT ALLOY CORE SECTION
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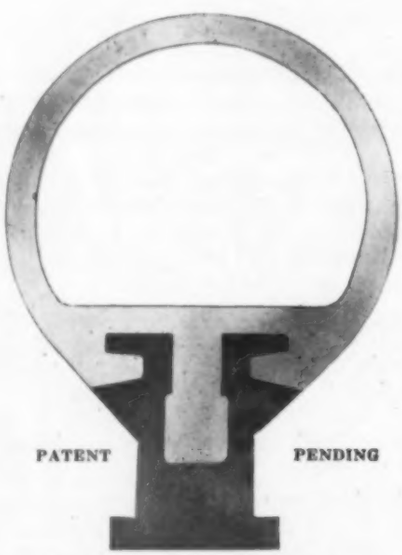

The heavy shaded portion in the above illustration shows the steel tongue casting which means a steel trimming line, elimination of breakage and wear. Cast steel fittings for automatic chucks, clamping rings or other parts.

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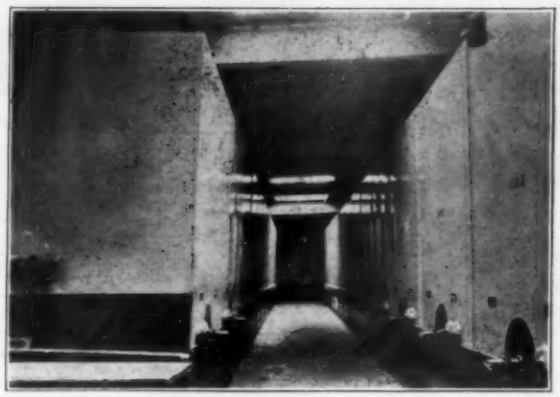

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EDITORIAL COMMENT

Cleaning Up Tire Advertising

THE National Better Business Bureau, which is the watchdog of good advertising in the United States, has observed that retail tire advertising is not all that it should be and has enlisted the support of a large number of important tire and rubber companies in a campaign to make tire advertisements faithfully reflect the goods which are for sale.

A "double mileage" tire, the Bureau reports, is very probably a rebuilt tire in which two treads have been sown together. The motorist naturally puts a different meaning on the term. The same rebuilt tire may be described as a "double tread" tire, which is equally misleading.

The public is also frequently misled when it buys "blemished" tires. Many unscrupulous tire dealers, the Bureau says, has seized upon this term as descriptive of second quality tires because it conveys to the prospective purchaser the idea that the tires are suffering merely from surface blemishes which in no way affect their durability. The tires are really "seconds." All tires are "firsts" or "seconds." The term "blemish" has been coined to minimize the defects which keep the tire from being a "first." The public is further confused by involved mileage guarantees.

The National Bureau aims to correct these abuses by country-wide adoption of a code of advertising and selling standards. Prominent among these will be a uniform way of marking second quality tires. At the present time tire makers use several different methods of marking such tires. Some buff off the serial number and the name of the manufacturer, some burn the name "second" into the sidewall, while others mark them "N. F. C." Still others use several circles or stars.

This confusion of marking means that the motorist is not sure of a second quality tire when he sees it and he is accordingly ready prey for the gyp dealer. Standardization of the branding of "seconds" should be quickly effected. Manufacturers will certainly give such a movement adequate support. Their own advertising has been uniformly of high character and none of them will desire to help protect the dealer who is short-sighted enough to jeopardize his market.

A Year of Fair Profits

ALL of the leading rubber manufacturing companies of the United States, with one or two exceptions, have by now made public their financial statements for the past year. Taken as a whole they speak exceptionally well for the health of the industry. A large majority of the companies returned profits of substantial size. In one or two instances a record in earnings was established.

On the credit side of the ledger Goodrich, Fisk, Hood, Dayton, Kelly-Springfield, Goodyear, Firestone, Seiberling, General and Mohawk all showed profits and a sound financial position. Goodrich had the best year in its history. The same was true of Dayton. U. S. Rubber, whose statement is not yet available as this is written, is also expected to show a profit. On the other side of the ledger a few of the companies came out in the red but in no case did their financial position cause any great alarm to their stockholders and steps have been taken in each case to strengthen their position substantially during the coming year.

The excellent showing of the industry is all the more to be a subject for congratulatory remarks when it is remembered that the year has not been without some disturbing conditions that made for anxious moments on the part of those executives and boards of directors on whom rested the responsibility of making satisfactory answers to unsympathetic stockholders. The industry has been working throughout the year in a falling crude rubber market. The tire industry was affected by a period of extremely low production in the automobile industry during which the demand for original tire equipment was at a minimum. Ford, with his normally huge tire requirements, was practically out of the market for the greater part of the year. Competition among the manufacturers in securing wider distribution has also taxed the sales acumen of the selling staffs of all companies.

Rubber manufacturing profits are always tied up with the stability of crude rubber prices. Unusual stability was achieved last year and good profits resulted. Although the first quarter of the current year has brought sensational fluctuations they have not been so great or so timed as to jeopardize the profits for this year.

The RUBBER AGE

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The Only Twice-a-Month Rubber Publication.

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NEWS of the INDUSTRY

Financial—Business
Building Operations
Personals
New Products

GOODRICH GIVES OUT FINAL ANNUAL REPORT

Net Profits Are $11,780,306 After Setting Aside $1,000,000 for Reserve Equivalent to $15.44 on Common Stock.

THE final report of the B. F. Goodrich Company and subsidiaries for the year ended December 31, 1927, shows a net profit to the parent company of $11,780,306 after deducting all charges and after setting aside $1,000,000 for addition to the reserve for contingencies. After deducting 7 per cent preferred dividends, this profit is equivalent to $15.44 earned on the 602,216 shares of common stock of no par value. In 1926 the net profit of the company was reported at $5,065,110, but this included $5,000,000 which was transferred from the contingent fund previously set aside. Excluding, therefore, this credit from reserves the net profit for 1926 was only $65,110 or 18 cents a share on the 362,840 preferred shares and nothing on the common stock.

The company expended during the year a total of $2,250,000 for additions and improvements to properties and an additional $1,500,000 in cash toward the erection of the new plant of the California Goodrich Company at Los Angeles.

The preliminary report made at the regular meeting of the stockholders on January 25 has already been reported in THE RUBBER AGE of February 10. The figures given therein are substantially the same as those in the company's final report.

CONSOLIDATED INCOME ACCOUNT
B. F. GOODRICH COMPANY

	1927	1926
Net Sales	$151,684,960	$148,391,478
Manufacturing expense	132,389,668	138,640,094
Profit	$19,295,292	$9,751,384
Other income	1,219,602	770,289
Total income	$20,514,894	$10,521,673
Depreciation	3,007,490	2,481,102
Interest, etc.	2,927,098	2,975,461
Federal taxes	1,800,000	.....
Reserve	*1,000,000	.....
Net profits	$11,780,306	$5,065,110
Preferred dividends	2,477,510	2,560,670
Common dividends	2,406,840	2,406,240
Surplus	$6,895,956	$98,200
Earn. surplus	†27,492,550	21,157,480

*Set up for contingencies and to cover possible losses due to fluctuations in prices of raw material.
†After adjustment of $560,885 for additional Federal taxes applicable to years 1924 and 1925.

J. H. SCHADE, director of laboratories of the B. F. Goodrich Company at Akron, spoke on February 23 before the University of Michigan Section of the American Chemical Society.

P. W. BARKER APPOINTED TO RUBBER DIVISION POST

The Department of Commerce, Washington, D. C., has announced the appointment of P. Wallace Barker as assistant chief of the Rubber Division, Bureau of Foreign

P. W. BARKER

and Domestic Commerce, to succeed C. Reed Hill, who recently resigned to go with the Fisk Tire Export Company.

Mr. Barker comes to his new position after six years' service in Washington as special foreign trade representative of The Rubber Association of America. During his close contact work with the Rubber Division of the Department of Commerce he has been largely responsible for the compilation of the loose leaf tariff manuals on import duties imposed by foreign countries on manufactured rubber goods. Other work undertaken in cooperation with the Rubber Division has consisted of statistical studies of the world's crude rubber production and absorption.

Mr. Barker is 32 years of age and a native of New Jersey, where he was educated at the public schools of Woodstown and Atlantic City, later attending George Washington University, at Washington, D. C.

Though comparatively young, Mr. Barker has been associated for more than ten years with various government departments in Washington, among them being the Department of Commerce, Department of Agriculture, and the United States Shipping Board. During the World War he enlisted in the U. S. Navy, performing duty aboard destroyers Maddox and Flusser.

BOSTON RUBBER GROUP TO ORGANIZE ON MAY 9

Fourth Local Group of Rubber Division, A. C. S., Will Be Formed at Meeting Called by C. R. Boggs—Four Papers Will Be Read—Everyone Invited.

THE fourth and last of the local groups to be organized within the Rubber Division, American Chemical Society, will get under way on the evening of May 9, when the Boston rubber technologists will get together. The call has been issued by C. R. Boggs of the Simplex Wire and Cable Company, who is acting on behalf of the executive committee of the Division.

Four papers, limited to about 20 minutes each, will be presented, the titles and authors being as follows:

"Theory of Reinforcing Pigments."
DR. JOHN T. BLAKE, *Research Chemist, Simplex Wire & Cable Co.*

"Illustration of Reinforcing Pigments,"
JOHN M. BIERER, *Technical Supt., Boston Woven Hose & Rubber Co.*

"Rate of Heat Transfer in Rubber Goods during Vulcanization,"
T. M. KNOWLAND, *Development Supt., Hood Rubber Co.*

"Structure of Rubber,"
WARREN K. LEWIS, *Professor of Physical Chemistry, Mass. Institute of Technology.*

The meeting will be held at the Boston Chamber of Commerce on Wednesday, May 9, beginning with dinner at 6.00 p. m. The four papers will be read immediately after the dinner and ample time will be allowed for discussion.

Chairman Boggs states that the papers will be presented in such a way as to be of interest to the non-technical rubber men who are expected to attend the meeting. On the other hand, the experience of the authors will be a guarantee that the papers will be fundamentally sound so that the technical men will find them of genuine interest.

All members of the Rubber Division in and around Boston will be invited to attend the meeting and invitations will be sent as well to rubber companies in the district so that everyone interested, whether technically inclined or not, will have an opportunity to attend. The chairman has announced that anyone interested in rubber will be welcome at the meeting. Advance reservation should be made with Mr. Boggs. The organization of the Boston group will complete the original plan of the Rubber Division for four local groups.

AKRON RECLAIMING CO. ELECTS NEW OFFICERS

Stockholders Select J. B. Huber as New President — Two New Directors Named—Etling and North Leave Company to Enter Private Business.

CHANGES in the executive personnel of the Akron Rubber Reclaiming Company were announced February 6, following a meeting of the stockholders. J. B. Huber succeeds B. O. Etling as president and Albert R. Henry and Arnold H. Smith were elected to the board of directors in the place of Mr. Etling and C. O. North. Both Mr. Etling and Mr. North resigned because of the pressure of their many outside interests which demanded their time.

Mr. Huber, an attorney of Akron, has heretofore held no administrative office in the company but has been a prominent stockholder and a member of the board.

Other officers re-elected include J. M. Alderfer and William Welsh, vice-presidents, and W. A. Hart, secretary and treasurer. These three were re-elected. Other directors are J. B. Huber, William Welsh, J. M. Aldefer, C. W. Seiberling and R. M. Fillmore.

The company's financial statement for the past year which was recently made public and which was reported in the last issue of THE RUBBER AGE, shows a very satisfactory condition within the company.

Smith Reference Service

The technical reference service established in Akron by Dr. Julian F. Smith and Irene F. Smith will cover six classes of rubber technology, Dr. Smith has announced. These classes are: (1) Latex, crude, reclaim, and compounding; (2) Physics, testing and analysis; (3) Chemistry, synthesis, aging and age resisters; (4) Curing, curing agents and accelerators; (5) Manufacturing methods and equipment; (6) Rubber goods—articles made of or with rubber.

In each class the abstracting service will cover periodical references, patent references and new books and pamphlets. The price for the entire rubber service will be $28 per quarter year but separate service on any class or on any part thereof can be arranged for.

Thirty other classes of service are offered in non-rubber fields such as plastics, metallurgy and dyes. The first abstracts will be issued in April.

Compact Vulcanizing Outfit

A new emergency tire repair outfit has been introduced by the Goodyear Tire & Rubber Company in the form of the new Goodyear Premier Electric Vulcanizer. This inexpensive and compact vulcanizing outfit consists of a pressure clamp, a curing plate and patches and is packed in an attractive can no larger than the standard tube repair kit. It is claimed it is so easy and rapid of operation that a patch can be perfectly vulcanized in 8 minutes. The vulcanizing is done electrically and the current may be obtained from tail light, dash, headlight or any single base light socket of the car. Complete outfits in gross lots are offered at 95 cents a set or at retail at $1.50 per set.

FIRESTONE COTTON MILLS OFFERS NEW BOND ISSUE

A syndicate composed of Otis & Company, the Cleveland Trust Company and the National City Company have offered an issue of $12,000,000 20-year sinking fund bonds of the Firestone Cotton Mills to yield 5.22 per cent. The entire capital stock of the company is owned by the Firestone Tire & Rubber Company, Akron, which guarantees principal, interest and sinking funds of the bonds.

The proceeds of the sale of the bonds are for the expansion of the fabric making facilities of the company. The Sanford Spinning Mills at Fall River have not been adequate and a new cotton mill property was recently acquired at New Bedford, Mass.

ASBESTOS ASSOCIATION INCLUDES RUBBER FIRMS

At the recent annual meeting of the Asbestos Brake Lining Association the announcement was made of the addition of a new member to the association, the Union Asbestos & Rubber Company, of Cicero, Ill. W. H. Dunn, of the Manhattan Rubber Manufacturing Company is a vice-president of the association, which includes a number of rubber companies among its members. The technical committee of the association consists of engineers from Russell Manufacturing Company, Thermoid Rubber Company and Ferodo Asbestos and Manufacturing Company.

Wishnick-Tumpeer Expands

Wishnick-Tumpeer, Inc., announce the opening of a Trenton office under the direct supervision of R. F. McGrory, who has been a well-known figure in rubber circles for many years. Mr. McGrory will act as manager for Wishnick-Tumpeer Rubber Division but will retain his other business connections as in the past. The establishment of this new office is in line with the company's policy of dealing direct with the consuming trade and will also give the company additional distribution facilities.

Moves to Larger Quarters

The Boston branch of the Mohawk Rubber Company has been moved to 1249 Boylston Street where larger quarters will permit the carrying of large stocks of tires and tubes. Increased business in the Boston district is reported to have necessitated the change.

TOY BALLOON MAKERS FORM ORGANIZATION

Toy balloon manufacturers of the United States have perfected plans for a trade association and held the first meeting of their organization at the Akron City Club, February 28. The new organization will be known as the American Balloon Manufacturers' Association. The acting chairman at the initial meeting was C. M. White, Jr., an Akron crude rubber broker, who has been the leading figure in arranging the present organization. Only representatives of Ohio companies attended the first meeting.

The most important action taken at the conference was the subscription of a fund to employ a cost accountant who will visit toy balloon manufacturers throughout the country as a preliminary step in securing data with a view to later adopting standard sizes and weights of balloons. Plans were also begun for the launching of a nation-wide advertising campaign for toy balloons.

An executive committee was appointed composed of H. R. Gill, Eagle Rubber Co., Ashland; J. C. Gibson, Pioneer Rubber Co., Willard; O. A. Scatterbury, Toycraft Co., Ashland; Nelt Barr, Barr Rubber Co., Sandusky, and J. W. Shira, Oak Rubber Co., Ravenna. These directors will serve six months.

Manufacturers represented at the meeting were the World Rubber Co., Wadsworth; Mohican Rubber Co., Ashland; Par Manufacturing Co., Bowling Green; Western Reserve Rubber Co., Akron; Pioneer Rubber Co., Willard; Maple City Rubber Co., Norwalk; Oak Rubber Co., Ravenna; Good Rubber Co., Akron; Wooster Rubber Co., Wooster; B. & G. Rubber Co., Nankin; Perfect Rubber Co., Mansfield; Miller Balloon Corporation, Crestline, and Barr Rubber Products Co., Sandusky.

New Golf Ball Company

The Bon-Dee Golf Ball Company, 5626 McGraw avenue, Detroit, has been incorporated under the laws of Michigan for the purpose of manufacturing golf balls, and production is already under way. It is understood that the company will manufacture Bon Dee "Thrill," a long-distance ball, to sell around seventy-five cents, and the Bon-Dee "Trusty," which will retail at about fifty cents. The company is said to have the equipment to produce 750 dozen balls per day. The incorporation report of the company places the capitalization at $250,000.

Differ Politically

Following the announcement of Frank A. Seiberling, president of the Seiberling Rubber Company, to run as a Willis delegate from the 14th Ohio congressional district, Chares W. Seiberling, his brother and vice-president of the same company, announced his intention of entering his name on the same ballot as a delegate for Hoover.

Gates Rubber Co. Puts New Power Plant Into Operation

Built at a Cost of $300,000, It Will Generate all the Electrical Power Besides 170,000,000 Pounds of Steam for Manufacturing Processes —Erected by Company's Own Engineering Staff.

THE new $300,000 power plant of the Gates Rubber Company at Denver, Colo., now in course of completion, will be in full operation before the end of March, according to Carl Ahlquist, the company's chief engineer, who is in charge of construction.

Some time ago, the Gates Rubber Company discovered that it was consuming 6 2/3 per cent of all the electric current generated for power and light by the Denver Public Service Company and decided to establish its own power plant.

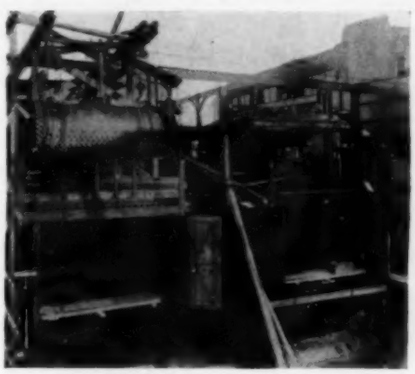
The new power unit will generate the 10,000,000 K.W. consumed by the company annually and will be capable of raising this amount to a comfortable surplus in the event of further expansion. The plant will also generate 170,000,000 pounds of steam for use in the rubber manufacturing processes, supply hydraulic for presses and compressed air wherever required. Two 613 HH.P. Erie City cross drum water tube boilers operate at 400 pounds working pressure and 250 degree super-heat, making the plant one of the highest pressure installations west of the Mississippi.

All pumping equipment is electrical. There are one 200-pound hydraulic, one 300-pound and one 1400-pound hydraulic. A new fine pump, electrically driven has a capacity of 1,000 gallons per minute and there are two large electrically driven air compressors. There are two 1,000 K.W. condensing turbines and one 500 K.W. back-pressure turbine. The 500 K.W. turbine will operate on a back-pressure of 125 pounds and furnish steam to the many factory departments which consume in the neighborhood of 25,000 to 35,000 pounds of steam per hour.

Can Be Operated by One Man

Power plants of similar capacity usually take about ten men to operate, but the new Gates plant is so fully equipped with modern labor-saving devices that, with only a few levers and push buttons, one man can control all operations. Dump cars dump the coal into pits from which by gravity and a drag chain it is fed into the crusher. It is then elevated to the coal bunkers above the boilers and gravity fed to the automatic stokers. Ashes are removed by similar methods.

Another economy feature is that almost the entire requirements of the plant in the matter of water will be produced from the company's own well. This has been made possible by the installation of a cooling tower equipped with two ten-foot fans. The capacity of this cooling system is 3,000 pounds per minute and the water is used over and over again.



The Two Cross Drum Water Tube Boilers Have 1200 H. P. Capacity

The plant has been built by the engineering department of the company, under the direction of Mr. Ahlquist. Wood & Webber, Inc., of Denver, were retained as consulting engineers.

Because of its comparative isolation from other large tire manufacturing centers, the Gates Rubber Company has developed its own service departments to a point where it is largely independent of others. For example, some twenty-two factory buildings have been erected by Gates' own building department according to plans and under the supervision of its own architects and engineers. The company makes its own tire molds and is able to get into production on any new size within thirty days.

DAYTON RUBBER COMPANY INCREASES PRODUCTION

John A. MacMillan, president and general manager of the Dayton Rubber Manufacturing Company, has announced that within 30 days his company will have increased its manufacturing facilities to a point that will enable it to produce $15,000,000 worth of tires and fan felts a year. This represents an increase in production capacity of some $5,000,000 over present manufacturing capacity of $10,000,000.

The Frank Hill Smith Company, general contractors, are now installing four large new 60-inch mills, one three-roll calendar, electric motors, and other equipment in the Dayton plant at an approximate cost of $100,000.

N. T. D. A. CONFERENCE ADOPTS NEW FEE RATES

The conference of the board of directors of the National Tire Dealers' Association, held last month at Akron, was productive of several results which are being looked upon as having an important bearing on the future success of the association. The outstanding accomplishment of the conference was the adoption of a new affiliation basis to the national body for both state and local tire dealers' associations.

The state associations may now affiliate with the national organization on the payment of a fee of $100. The fee for a local association was set at $50. Individual memberships will continue on the same fee basis as has been operating for some time, the membership being divided into three classes as follows: Firms doing a sales volume in excess of $50,000, a fee of $50; firms doing a sales volume of from $15,000 to $50,000, a fee of $25; firms doing a sales volume of less than $15,000, a fee of $10. All such fees are for a year's membership.

Several new services were created by action of the conference and the directors went on record as energetically favoring the standardization of rim sizes and the simplification of tire sizes. The board also decided to establish about 18 zones throughout the country to facilitate cooperation between the individual tire dealer members, local associations and the national association.

SAMSON TIRE ACQUIRES SAN DIEGO TIRE PLANT

The Samson Tire & Rubber Company, Los Angeles, Cal., are reported to have purchased the Spreckels Savage Tire factory at San Diego and will turn it into another manufacturing unit to supplement their production. The main plant of the Samson Company at Compton, just outside of Los Angeles, has been enlarged on various occasions, five additions having been made in the last two years, to allow for the increased business which has been enjoyed. It is reported that the plant has been operating on a twenty-four hour schedule for the last two years in order to keep up with sales.

The new unit at San Diego will allow for additional production and the company expected to get the output at the new unit up to 1,000 tires by the middle of the year.

The company has eleven branches west of the Rocky Mountains and three in the East. Last year the concern did a gross business of slightly more than $8,000,000 and on December 31, 1927, had earned a surplus of approximately $717,000.

The Pocono Rubber Cloth Company, of Trenton, N. J., has been operating at capacity during the last year. The concern manufactures rubber cloths for automobiles and specializes in rubber articles for sporting goods.

GOODYEAR MECHANICAL DEPT. CELEBRATES

Operations Started in 1913—Sales Have Increased Ten-Fold During Period—Veteran Employes Receive Service Pins—Slusser Officiates.

THE fifteenth anniversary of the establishment of the Mechanical Goods Department of the Goodyear Tire & Rubber Company was celebrated by a banquet held on February 1 at Akron. The dinner was also made the occasion for the presentation of 15-year service pins to three veteran employees who have been with the mechanical goods department since its initial start in 1913.

Those who were awarded the pins were D. R. Burr, manager of mechanical goods sales, Williams Metzler, consulting superintendent of the mechanical goods production department, and Russell R. Peebles, of eastern division sales.

Among the 65 present at the dinner, which was attended by both sales and production men, were Fred Gras, a veteran of 26 years with Goodyear, George McCrea, manager of mechanical goods sales at the Goodyear Canadian plant, and A. M. Hardy, who has been at the Canadian plant for 29 years, his service dating back before the acquisition by Goodyear of the Durham Rubber Co. Among others responsible for the success of the department are G. A. Grauer, assistant manager of sales, H. B. Post, manager of export sales, H. E. Campbell, factory division superintendent, and H. E. Morse, manager mechanical goods factory department.

C. C. Slusser, vice president and factory manager of the Goodyear Company, was toastmaster and made the presentation of the service pins. Mr. Slusser told of Goodyear's growth in the mechanical goods field during the 15-year period in which sales increased ten-fold.

Success of the company in this field Mr. Slusser declared, was largely due to the policy laid down in the beginning of selling the customer what a scientific study showed he needed in belting, hose, or other product. This scientific sales policy is carried on by the Goodyear Technical Man, as he has come to be known.

Robert Bridge

The British rubber trade papers have recently devoted considerable space to obituaries on the late Robert Bridge, chairman and managing director of David Bridge & Company, Ltd., who died on Christmas Day at his home in Colwyn Bay, England.

Mr. Bridge, who started early in life in the business of his father, the founder of the firm, was one of the most prominent figures in the machinery trade supplying the rubber industry. It was soon after his entrance into the business that he developed the application of friction clutches to the driving of rubber machinery on the plantations in the Middle East. Besides making a wide range of equipment for rubber estates and manufacturing plants, his firm also holds the manufacturing rights for the United Kingdom for a number of American rubber machinery companies.

Reno F. Dutt

Reno F. Dutt, treasurer and general manager of the Manufacturers Rubber & Supply Company, Akron, died suddenly at his office on February 21 of heart disease. Before founding his own rubber supply company Mr. Dutt held positions with the Goodrich organization and Union Rubber Company.

Eugene D. Burnell

Eugene Dickson Burnell, vice-president of the Overman Cushion Tire Company, died suddenly of a cerebral hemorrhage at Atlantic City, N. J., on February 20. Mr. Burnell, who was a graduate engineer, became identified with the Overman Cushion Tire Company in 1921 and has had an active part in the affairs of the company up to the time of his death.

Leases New Plant

The California Rubber Products Company, Redwood City, California, operating a guttapercha refining works and manufacturer of golf balls and kindred products, has completed plans for the leasing of the plant of the Silver Gate Poultry Company, which will be remodeled and improved as a new plant for the company. It is proposed to begin the installation of new machinery at an early date.

New Addition Completed

The new addition to the Toronto plant of the Goodyear Tire & Rubber Company of Canada, Itd., is now completed and in operation, thus relieving the congestion under the high production schedule which has prevailed in the plant. The factory is working twenty-four hours a day and with the productive capacity increased by the new wing, the output for the current year is expected to show a substantial increase over last year.

To Lay Off Workers

The Woonsocket and Millville, Mass., plants of the Woonsocket Rubber Company is expecting to lay off 1,500 employees from March 16 to April 1, according to notices posted at the plants. The open winter which has resulted in a lack of demand for rubber footwear is given as the reason for the temporary shutdown.

Northern Gives Warranty

The Northern Rubber Company, Akron, have determined upon a new plan for guaranteeing tire service. The feature of the idea is a certificate of warranty covering all road hazards for a year, which will be given to purchasers of a Northern tire by the dealer.

GOODRICH SOCIAL CLUB HOLDS FIRST MEETING

The All-For-One—One-For All Club was formed by 800 officials, department heads, factory foremen and process engineers and other employees of the B. F. Goodrich Company at a special get-together party held in Knights of Columbus Hall, Akron, on February 17.

The purpose of the organization is to bring together the key men of various groups representing all activities in manufacturing and selling Goodrich products. Parties similar to the initial event will be held from time to time with the idea of developing the social side of their associations.

Short talks by T. G. Graham, new member of the board of directors, and E. C. Stoner, process engineer, followed a "grid-iron" introduction by Gates Ferguson, advertising manager, who acted as toast mastemr on the occasion of their first get-together.

A special feature of the evening was a surprise trip to California to visit the new Pacific Goodrich factory in Los Angeles. Special movies were taken of the California factory on February 10 and rushed to Akron by airplane for the party.

Hankins Rubber Company

The Hankins Rubber Company, Massillon, Ohio, expects to be in production on a full line of surgical rubber goods within the next month. Equipment is now being installed.

S. Bert Hankins is president of the new company and Mrs. L. E. Hankins is secretary and treasurer. Both severed their connection with the Massillon Rubber Company, with which they had been connected for 15 years, on January 12. The Hankins Rubber Company, with an authorized capital of $100,000, was incorporated immediately thereafter. The new company is entirely separate from the Massillon Rubber Company.

The Hankins products will include a full line of rubber items for surgical needs, such as gloves, examination cots and drainage tubing. The products will be sold entirely through the trade.

William J. Ries, vice-president of the company, will be superintendent of the factory. He has had a wide experience in the manufacturing of rubber gloves and during the war was a government inspector of rubber goods for England.

Gates Branch Moves

The Gates Rubber Company, Denver, Colo., has moved its New Jersey branch warehouse from Jersey City to larger and more convenient quarters at the Hoboken Terminal Building, Hoboken. A. C. Ockelmann will continue as the Gates Company's branch manager at Hoboken.

ASSESSMENTS OF ESTATES SHOWS SHARP REDUCTIONS

Considerable dissatisfaction is reported from the plantations of the Middle East, which are subject to the administration of the rubber restriction policy over the re-assessments of the individual estates. In almost every case reported so far the revision of the assessments has been a sharp reduction from that of last year.

New assessments allotted to some of the leading rubber companies for the 1927-28 rubber restriction year are given below with comparisons with the previous twelve months:

Estate—	1927-28 lbs.	1926-27 lbs.
Ayer Kuning	1,075,600	1,320,675
Bradwall	655,279	784,480
Chersonese	732,271	860,031
Harimau	122,961	114,860
Highlands	1,864,378	2,030,656
Klabang	1,092,884	1,201,468
Krian Rubber Plants	556,637	726,702
Majedic	148,000	231,202
Permas	288,015	384,254
Sungei Krian	1,037,994	1,161,234

CALIFORNIA GOODYEAR HAS PROSPEROUS YEAR

The Goodyear Tire & Rubber Company, of California, reports for the year ended December 31, 1927, a net income of $2,103,432 after taxes, charges and reserves have been deducted. The company reduced its indebtedness during the year by $1,806,000 and acquired the ownership of the Goodyear Textile Mills Company, through the purchase of all the common stock at a cost of $1,299,017.

Total assets as of December 31, 1927, were $12,752,839 as against current liabilities of $2,270,414. Surplus was put at $4,329,530.

Plans Addition

The Roessler & Hasslacher Chemical Company, 709 Sixth Avenue, New York City, will build a one-story addition to their plant at Niagara Falls, N. Y., to cost approximately $80,000 with equipment. The contract for the building has been let to Wright & Kremer, Niagara Falls.

Rubber Plant Has Fire

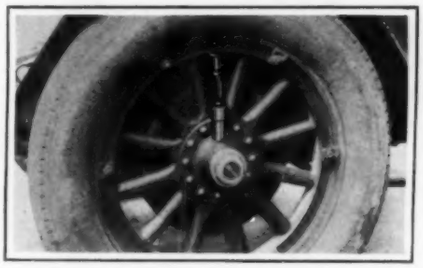
The plant of the Pilgrim Rubber Corporation, Pawtucket, R. I., was damaged by fire on February 21 and considerable loss was occasioned both to the building and to stocks of manufactured goods. The company recently moved to Pawtucket from Woonsocket,, R. I.

Struthers-Wells Company

The Struthers-Wells Company, Warren, Pa., has planned an elaborate manufacturing program for the coming year, which will include a complete line of heat exchangers in five different types. New evaporators, driers, condensers and auxillary equipment will also be developed. The company has appointed H. W. How, formerly chief engineer of the Buffalo Foundry and Machine Company, as consulting engineer in a permanent capacity.

Automatic Tire Inflator

An automatic tire inflator to keep the air pressure within a tire always at a desired point, has been introduced by the Yellow Jack-It Manufacturing Company, 211 North Green street, Chicago, Ill. The device fits on the wheels of the automobile as



shown in the accompanying illustration. When the tire is up to the proper pressure no more air will enter as the valve is so set that surplus air passes out through the exhaust. If the tires lose air for any reason a few miles driving will bring them back to normal pressure. It does not interfere with the mounting or removing of the tire.

New Rubber Concern Formed

The Standard Rubber Company, a new concern of Mansfield, Mass., has leased the plant of the old Wool Purifying Company and is expected to begin operations shortly. The company will reclaim rubber from scrap inner tubes and manufacture heels and rubber tiles. The officers of the new corporation include W. A. Sanborn, president; T. A. Farrell, treasurer and A. C. Ruger, secretary. Mr. Farrell was formerly associated with a rubber goods manufacturing plant at Ridgeway, N. J.

Replogle in Europe

H. H. Replogle, manager of the rubber service department of Grasselli Chemical Company, 347 Madison Avenue, New York City, sailed on the Olympic on February 24 for England, where he will call on William Somerville's Sons Rubber Company, Ltd., London. This firm handles the Grasselli line of accelerators in Great Britain in addition to representing other American producers of mineral rubber, clay, carbon black, lithopone and pine tar. They also produce their own line of reclaimed rubber. Mr. Replogle is expected to return about the end of March.

First Fatality of 1928

The first industrial fatality in the rubber industry during the present year occurred on February 12, at Barberton, Ohio, when A. F. Bass, 48, a power house engineer employed by the Seiberling Rubber Company, was instantly killed by the falling of an iron grate bar from a boiler.

DUNLOP TO MANUFACTURE GOLF BALLS AT BUFFALO

The Dunlop Tire & Rubber Company, Buffalo, N. Y., has announced that they will begin immediately the manufacture of golf balls on a large scale. Over 40,000 square feet of floor space in the $22,000,000 Buffalo plant have been equipped for the production of this new line. Heretofore, the company has imported the Dunlop ball in large quantities but according to their announcement, they believe the increase in the number of people playing golf in America justifies them in extending their domestic manufacturing operations to this new line. The imported ball has been retailing at $1.00 and the domestic product will be offered at 75 and 50 cents. The 75-cent line will be known as the Dunlop "Maxpar," while the cheaper ball will be known as the "Warwick."

To insure that its new golf balls will meet high standards of quality the Dunlop company has installed several devices for testing golf balls. There is a driving machine which drives the ball upwards of 200 yards on the fly, testing its resiliency and accuracy of flight. For determining the putting accuracy of balls, another testing machine has been developed by company engineers. A pendulum strikes the ball down a level marble slab covered with billiard table cloth, where it rolls into one of the five pockets running across the end of the table. The relative accuracy of the ball is determined by the distance between the center line and the cup in which the ball lands.

BUREAU OF STANDARDS STUDIES TIRE TREADS

The Bureau of Standards at Washington, D. C., is conducting a series of studies to determine how and why the treads of automobile tires wear and the effect of axle load and air pressures. The experiments are being carried on by means of a specially constructed apparatus devised to ascertain by delicate observations the varying configurations in tire treads. The apparatus includes a miniature car moving back and forth on a track by rack and pinion, with the tire pressing against a piece of clear plate glass under varying pressure loads.

Pro-Golfers Lose Gratuities

New rules adopted by the golf ball industry and approved by the Federal Trade Commission will prohibit the payment in the future of secret salaries to professional golf players in order to have them use the balls of a particular manufacturer and the payment of special "prize money" to those who win matches with certain makes of balls.

The new rules have been formulated by the manufacturers themselves as a result of complaints which reached the Federal Trade Commission against certain practices of the industry.

Timely Financial News

FISK SHOWS STRONG FINANCIAL POSITION

Increases Unit Sales During Year By 14½ Per Cent.—Shows Net Profit of $2,620,721—Production Capacity of Plant Increased 25 Per Cent.

THE annual report of the Fisk Rubber Company for the 14 months ended December 31, 1927, shows a net profit, after deducting all charges, of $2,620,721. After deducting dividend requirements on all preferred and preferred convertible issues a balance is reported of $1,150,609 or the equivalent of $1.36 per share on the 840,684 shares outstanding of no par common stock.

The report covers 14 months owing to the change voted by the board of directors in June, 1927, in the fiscal year period from October 31 to the end of the calendar year. No figures are made public covering the twelve months ended October 31, 1927, which could be comparable to the previous annual report of the company, but for the fiscal year ended October 31, 1926, the company reported a net profit, after deducting all charges and preferred dividend requirements, of $1,843,291 or the equivalent of $2.23 per share on the 825,116 shares of common stock then outstanding.

In addition to the subsidiary selling companies heretofore included in the company's balance sheet, the present report now includes the accounts of the Fisk Tire Fabric Company and the Fisk Rubber Company (Far East) Ltd., which is the company's crude rubber purchasing office in the Straits Settlements.

Sales Total $72,404,002

Sales for the 14 months ended December 31, 1927, totaled $72,404,002 as against $68,051,739 for the 12 months ended October 31, 1926. Dollar sales for 14 months ended December 31, 1927, were 6 per cent less than for the same relative period in 1926.

In his statement accompanying the report, H. T. Dunn, president of the company, said, "Due to the lower level of selling prices the comparison of sales over the last two years does not reflect the gain in business enjoyed by the company as unit sales for the same period of 1927 increased 14½ per cent.

"During the last three years and two months the company has revamped its entire manufacturing plant lay-out to the end of developing the most up-to-date and efficient methods of operation. There have been installed the most modern machinery and equipment and conveyor systems, which will result in lower manufacturing costs. The productive capacity of the plants during this period has been increased over 25 per cent. These additions and improvements involved a cash expenditure of approximately $6,500,000. Substantially all of this sum has been absorbed in operating costs through depreciation and obsolescence charges.

"The financial position of the company remains exceptionally strong. At December 31, 1927, there were no bank loans outstanding and current assets were $32,726,000 in excess of current liabilities, with a ratio of current assets to current liabilities of 9 1/3 to 1.

"During the year $1,256,000 par value of 5½ per cent sinking fund gold notes, due 1931, were purchased, $256,000 of which were used for current sinking fund requirements, leaving $1,000,000 held in the treasury. In addition, the company also purchased in the open market $1,210,000 7 per cent first preferred stock and now holds in the treasury a total of $2,154,800. These purchases will result in an annual saving in interest and dividends of over $220,000."

INCOME ACCOUNT
The Fisk Rubber Company

	14 mos. to Dec. 31, 1927	*Yr. ended Oct. 31, 1926*
Gross sales	$72,404,002	$68,051,739
Expense, depreciation, etc.	67,587,745	62,054,823
Operating profit	4,816,257	5,996,916
Other income	23,597	21,921
Total income	4,839,854	6,018,837
Interest, amortization, etc.	1,810,135	1,664,406
Federal taxes	409,000	.....
Contingent reserve	.....	1,000,000
Net profit	2,620,721	3,354,431
First preferred dividends.	1,086,638	1,200,738
First preferred convertible	312,725	233,847
Second pf. and management	70,749	76,565
Surplus	1,150,609	1,843,291

*Includes federal taxes.

GATES REPORTS LARGE GAINS IN 1928 SALES

The Gates Rubber Company, Denver, Colo., reports the first month of the year as a record one in the history of the company in accessories sales. The company manufactures an extensive line of rubber and fabric accessories headed by Vulco fan belts and radiator hose and distributes through regular jobber channels. The percentage of business done in different territories as compared with January a year ago shows an increase in every district.

Oak Rubber Company Prospers

The annual meeting of stockholders of the Oak Rubber Company was held February 2 at the general offices of the company, at Ravenna, O. The report for the past year showed the company to be in a satisfactory condition with a steady volume of business in hand. The plant is reported to be unusually busy for this time of year.

Officers for 1928 were elected, including John C. Goodmon, president; John W. Shira, vice president and general manager; and Paul E. Collet, secretary and treasurer.

GENERAL MOTORS MAKES RECORD INCOME IN 1927

The General Motors Corporation reports its net earnings for 1927 at $235,104,826, which is a new record for the company and has only been exceeded once in the history of industrial companies in the United States. The exception was the case of the United States Steel Corporation, which during the war year of 1916, showed a net income of $271,531,730.

General Motors did a gross business during 1927 of $1,269,519,673 or an increase of $211,366,335 over the year before. In point of number of cars and trucks sold, the gross sales represent the distribution of 1,554,577 cars.

After payment of the regular quarterly dividends on preferred shares and debenture stock, amounting to $9,109,330, there remained $225,995,496 as the amount earned on common shares of General Motors.

KELLY-SPRINGFIELD CO. HAS PROSPEROUS YEAR

The annual report of the Kelly-Springfield Tire Company for the year ended December 31, 1927, shows net income of $357,741 after deducting all charges, or the equivalent of $12.12 per share on the 29,500 shares of preferred 6 per cent stock, on which no dividends have been paid since April, 1924. Allowing for 6 per cent regular annual dividends on this preferred, the balance is equal to $3.43 a share on the $5,264,700 worth of 8 per cent preferred stock also outstanding. In the previous year the company recorded a net loss of $3,439,799 after crediting $1,000,000 to a reserve previously set up for fluctuations in crude rubber prices.

KELLY-SPRINGFIELD TIRE CO.
Balance Sheet, December 31, 1927

	1927	1926
ASSETS		
*Property, good will, etc.	$18,921,876	$19,549,130
Cash	1,490,715	1,844,854
Accounts and notes receiv.	5,294,258	4,479,453
Inventories	6,909,454	3,207,775
Deferred charges	389,530	605,608
Sundry investments	210,335	115,266
Totals	$33,216,168	$35,802,086
LIABILITIES		
8½% pfd. stock	$5,264,700	$5,264,700
6% pfd. stock	2,950,000	2,950,000
‡Common stock	9,096,003	9,096,003
Gold notes	5,000,000	6,000,000
Notes payable	7,025,648	8,361,636
Accounts payable, etc.	1,542,830	1,246,067
Taxes payable, etc.	332,649	246,921
Accrued interest	52,500	72,500
Reserves	379,654	383,370
†Approp. surplus	1,403,700	1,403,700
General surplus	140,484	77,189
Totals	$33,216,168	$35,802,086

*After depreciation. †For retirement of preferred stock. ‡Represented by 363,840 shares of stock, par value $25.

Timely Financial News

MASON RUBBER SHOWS LOSS DURING YEAR

Lack of Ford Tire Business Said to Have Caused Deficit—Minority Stockholders Renew Fight to Oust Present Management.

THE annual statement of the Mason Tire & Rubber Company, issued at the annual stockholders' meeting on February 22, shows a net loss to the company during the past year of $472,897. The report of W. A. Cluff, president of the company, states that the loss was primarily due to the failure to secure any business from the Ford Motor Company for tire equipment during the year.

Net sales for 1927 totaled $7,483,928 and the balance sheet shows gross profit of $2,232,265 before deducting selling expense, administration expense, discounts, interest and other charges. These charges, however, amounting to $2,542,751, bring the operating loss to $310,485. Losses on other income, and interest charges, bring the total loss to $472,897.

The officers and directors were re-elected against considerable opposition by minority stockholders. A fight has been waged for the past year by a minority group in an effort to get an accounting from the present officials of the company, and charging that 52,000 shares of common stock have been voted illegally by the management in the election of the present directors. A suit was filed by the minority group late in 1927 demanding a receivership and an accounting, but the receivership demand was later withdrawn. The reopening of the suit is now threatened.

The Bedford plant of the company, where Ford size tires only are produced, has been idle since last spring. The Kent plant has also been idle since the first of the year until recently, when operations were resumed.

RUBBER EXCHANGE SETS HIGH TRADING RECORD

All records for the volume of trading in a single week on the Rubber Exchange of New York were broken during the week which ended February 24. From February 18 to 24 inclusive 8,111 contracts calling for 20,277½ tons of rubber valued at approximately $13,500,000 changed hands. Owing to the exchange being closed on Washington's birthday, there were only five trading days in the week but the total volume exceeded that of any full trading week since the exchange has been operating.

Another record was also established during the week when the membership of George A. H. Churchill was sold to L. W. Dumont of L. W. Dumont & Company for $6,600. This was an increase of $100 over the previous sale and is the highest price at which a seat on the Rubber Exchange has as yet sold.

CATALPO!

RUBBER COMPANY STOCKS QUIET IN DULL MARKET

The stock issues of the leading rubber manufacturing companies have remained inactive in a generally quiet market for the past fortnight. Practically none of the issues have recovered the losses occasioned three weeks ago when the whole list on the exchanges in both New York and Cleveland suffered from a hard bearish drive. Firestone common has gone down still further to a new low of 182 and U .S. Rubber dropped to 45⅜. Fisk and Intercontinental also developed new lows for the year. Prices on the whole, however, have remained steady during the fortnight. The sluggishness in the trading in rubber company shares is due more to the general tone of the market than to any weakness in the rubber industry. The annual reports from the rubber companies which have now been made public, show the industry, in general, to be in a sound financial condition.

Late Stock Prices

	Last Price Mar. 6	Feb. 18	—1928— High	Low
Ajax	10⅛	9⅞	14¾	9¾
Firestone	182	210	224	182
do. 6% pfd.	109⅛	110	110	108
do. 7% pfd.	108⅝	108½	110⅛	108
Fisk	14¾	15¼	17¾	14¾
do. 1st pfd.	84	89½	98	84
General	180	184	190	180
do. pfd.	102	102	111	100
Goodrich	81⅝	80	99⅜	80
do. pfd.	109¼	109½	112	109½
Goodyear Com.	60¼	59	72½	57½
do. pr. pfd.	97⅝	98½	99½	96
do. pfd.	—	—	120	100
Hood	40½	41	43	42
India	18	21	23½	16
Intercontinental	15½	18	21⅜	14⅜
Kelly Springfield	22⅜	16	27⅜	15
do. 1st pfd.	75	—	78	75
do. 8% pfd.	78	56	84	55¼
Lee	18½	18¼	22⅝	17¼
Miller	23	21	27¼	21
do. pfd.	90	92	97½	90
Mohawk	30	35	40	20
do. pfd.	76	75	80	55
Seiberling	35	36	42½	35
do. pfd.	103½	104	105	102
Star	1	1	2¼	1
U. S. Rubber	45⅜	51¼	63¼	45⅜
do. pfd.	93½	101¾	109⅝	92½
U. S. Rubber Reclaiming	—	—	16½	14½
do. pr. pfd.	—	—	—	—
do. series A	—	—	—	—

MILLER RUBBER REPORT SHOWS FINANCES SOUND

Company Suffers Loss During Year But Statement Shows Present Ratio of Assets to Liabilities of 3 to 1—Sales Force Strengthened.

WHILE the Miller Rubber Company reports a net loss for 1927 of $392,632, the annual statement of the company shows a sound financial condition. Current assets were $14,130,875 against current liabilities of $4,626,361 or a ratio of more than three to one.

The plant is reported to be in excellent condition with new improvements and equipment added during the past year. Par value preferred stock retired during the year amounted to $513,000. Dividends on the preferred stock have been paid regularly and the payment due March 1 has been declared. Common stock dividends will be discontinued for the present.

The recent additions to the Miller sales force including L. C. Rockhill and four other Goodyear executives are expected to strengthen the organization.

CONSOLIDATED INCOME
Miller Rubber Company

	1927	1926
Operating profits	$1,048,830	$2,184,068
Depreciation	1,107,968	1,044,393
Federal taxes	.....	.....
Interest, etc.	333,494	114,221
Loss	$392,632	*$1,025,454
Loss	$392,623	$1,025,454
Preferred dividends	1,188,768	983,568
Common dividends	390,148	520,182
Deficit	$1,971,548	$478,296

*Profit before federal taxes.

CONSOLIDATED BALANCE SHEET

ASSETS

	1927	1926
†Land, buildings, machinery and equipment	$7,768,350	$8,125,540
Real estate not used	471,171	494,886
Cash	1,413,472	1,438,856
Notes, accounts and acceptance receivable	4,327,087	4,010,325
Inventories	8,389,516	11,441,788
Advances	.....	.....
Real estate mortgages and miscellaneous assets	530,884	587,843
Patents	1	1
Deferred charges	196,155	270,055
Total	$23,097,436	$26,369,294

LIABILITIES

	1927	1926
Preferred stock	$11,650,800	$12,163,800
Common stock	*5,201,100	5,201,100
Notes payable	2,450,000	1,350,000
Accounts payable	1,785,257	3,665,914
Dividends payable	233,016	130,049
Accrued taxes	158,088	161,037
Contingent reserve	300,000	300,000
Surplus	1,319,175	3,397,394
Total	$23,097,436	$26,369,294

*Represented by 260,147 no par shares. †After depreciation.

Names in the News

CLARENCE J. WELCH, sales manager of the manufacturers' division of the United States Rubber Company, was married recently to Mrs. Vivian deCarie McCann, in Chicago. After the middle of April they will make their home in Detroit.

R. I. WISHNICK, of Wishnick-Tumpeer, Inc., is supervising operations at the Lawrenceville, Ill., plant of his company. He will remain there until the second week in March.

E. C. TAYLOR, formerly of the legal department of the Fisk Rubber Company and closely identified with all patent work of his concern, has resigned to join the firm of Chapin & Neal, patent attorneys, at Springfield, Mass. R. P. HARVEY will take over the duties relinquished by Mr. Taylor.

V. R. JACOBS, of the Goodyear aeronautical department, recently addressed the Cleveland Advertising Club on the subject of "Rigid Aircraft." He has been identified with government sales and aeronautics for his company for the past eight years.

W. G. A. ORMSBY-GORE, British Under-Secretary for the Colonies, is leaving England this month for an official visit to Middle East. This will be the first occasion that such a visit has been made by a minister during his term of office, Colonial Secretary Amery not having included Malaya in the itinerary on his recent world tour.

CLARENCE D. CHAMBERLIN, of trans-Atlantic flying fame, has been retained by the U. S. Rubber Company as a consultant in connection with airplane tires. JOSEPH A. FAUCHER, also widely known in aeronautical circles has also been engaged by the same company as manager of airplane tire sales.

G. H. WHITTEN, of Whitten Bros., tire dealers of Richmond, Va., visited the plant of the India Tire & Rubber Company, Akron, recently to make plans for his 1928 business. Whitten Bros. have just opened a new store at 1400 Broad Street, Richmond.

FRANCIS R. HENDERSON, president of the New York Rubber Exchange, addressed the New York Junior Board of Trade and Transportation on March 1, at a luncheon meeting at 41 Park Row, New York City. He spoke on "The Romance and Development of Rubber."

GEORGE RICHARDS, superintendent of the calender room of the General Tire & Rubber Company plant at Akron, has been elected president of "The Generators," a club composed of the departmental heads of the company. LYLE AUSTIN, foreman of the tube department, was named vice-president, and FRANCIS FITZGERALD, of the advertising department, was named as secretary.

T. K. MILLER

Now Enroute to West Africa Where He Will Represent the Firestone Tire and Rubber Company

J. C. CUPPIA, a partner of the firm of E. A. Pierce & Co., and a prominent member of the New York Rubber Exchange, recently returned from a trip to the principal rubber manufacturing centers in Canada and the United States.

GEORGE H. WOOD has been promoted to the position of manager of the mechanical sales department of the Boston office of the B. F. Goodrich Rubber Company. Mr. Wood has been in the sales department of his company for the last 20 years. He succeeds E. E. LEACH, who has held the post for 28 years.

C. H. JARNHOLM, of Copenhagen, and G. T. RATH, of Havana, representatives of the United States Rubber Company in their respective countries, recently paid a visit to New York.

BERT BRAY is a new addition to the Boston sales force of the Mohawk Rubber Company and will cover northern Connecticut, western Massachusetts and Vermont for his company.

R. PAUL SCHREIBER, of the Goodyear Tire and Rubber Company, has resigned as editor of the news-letter of the Rubber Section, National Safety Council. The change is due to Mr. Schreiber's being shifted at Goodyear from safety work to rubber compounding. His successor has not yet been announced.

FRED. T. ROBERTS, JR., son of Fred. T. Roberts, president of the Paramount Rubber Company, Paterson, N. J., is credited with being one of the youngest inventors in the United States. At the age of ten he took out his first patent and has secured six additional ones since. All pertain to tools for raising automobiles without the jack under the axle. The boy's father is also an inventor, having 389 patents to his credit, the most widely known being the tennis ball.

ERNEST BLAKER, recently transferred to the Pacific Coast branch of the B. F. Goodrich Company, at Los Angeles, was the guest of honor at a dinner tendered him by his friends at the Akron City Club. He left for his new post on February 11. Mr. Blaker has had charge of the temperature and thermometer control at the home plant and is one of the experts to be sent to Los Angeles to smooth the operations of the new Pacific Coast plant.

WILLIAM O'NEIL, president of the General Tire & Rubber Company, is in the West on his annual business tour and is accompanied by HOWARD SMITH, Western sales manager, and FRANK GABLE, tire construction engineer. Mr. O'Neil will attend conferences at Seattle, San Francisco and Los Angeles, returning to Akron about March 1. Messrs. Smith and Gable will continue through the southwest, returning via Texas and the Gulf cities.

R. D. SNEDEKER, JR., who has been associated with Abercrombie & Fitch for the past seven years, has been appointed factory representative of the Alfred Hale Rubber Company, Atlantic, Mass., manufacturers of "Rajah" products. Mr. Snedeker, in his new position, will call on the manufacturing trade, promoting the sales of Web Grip Golf Soles, which is the latest product in the "Rajah" line of rubber soles.

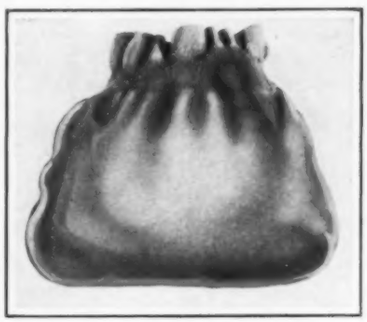
CY MARX, manager in the Texas district for the Mason Tire & Rubber Company for the past two years, has been transferred to the territory served by the Cleveland, Buffalo and Pittsburgh branches. The change comes in the way of a promotion for the excellent work which he has done for his company in Texas, where he has doubled the business in Mason tires and won for his district first place, in point of volume, in the entire Mason organization.

HARVEY S. FIRESTONE, SR., has been named chairman of the building committee of the Akron Y. M. C. A. The present building has been sold and plans are under way for the erection of a new and larger structure.

Rubber Goods and Specialties

Pocketbook Rubbers

The Vulcan Proofing Company, Brooklyn, N. Y., a subsidiary of the C. Kenyon Company, also of Brooklyn, has introduced a novelty in the way of a pair of rubbers of the foothold type enclosed in a small rubber pouch. These are meant to be carried



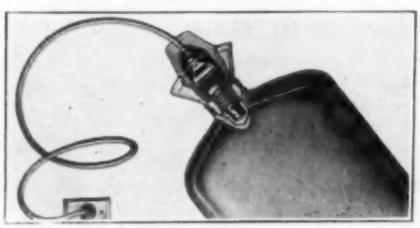
Pouch Containing Rubbers

in a lady's handbag for emergency use and are known as "pocketbook" rubbers. The chief feature of the new idea is the compactness and flexibility of the package.

The footholds contained in the rubber pouch come in two sizes, small and medium, and are sufficiently flexible to cover all size requirements. The colors are black, gray, brown and champagne. The quality is claimed to be of the best and while the rubbers are not made heavy enough to withstand prolonged wear, they are entirely satisfactory for emergency purposes and will serve in such a capacity for a long time. The pouch is only 3½ by 3 inches in size. It has a crimped top to keep the contents from falling out. The pouch is made of sheet rubber, plain or beautifully decorated.

Hot Water Bottle Heater

An electric stopper to maintain hot water bottles at an even temperature indefinitely is offered by the Appleton Electric Co.,



The Appleton Keephot Stopper

Chicago. The Appleton "Keephot" stopper contains an electrical heating element and is joined by rubber covered cord to any electric outlet. Danger of overheating, burning or short-circuiting is claimed to be entirely eliminated. The cost for current (A. C. only) is said to be only four cents per 24 hours. The stopper is fitted with a thermostatic control. The retail price, including 10 feet of cord and plug, is $3.00. The manufacturer emphasizes the value of moist heat, which the hot water bottle gives, as contrasted to the dry heat of an electric pad.

New Rubberized Golf Bags

The Pocono Rubber Cloth Co., Trenton, N. J., will offer golfers in 1928 several new styles of golf bags made from rubberized cloth and fitted with hookless fasteners. Different colors of cloth will be available.

Rubber Spat for Rainy Days

A high spat of a featherweight rubberized fabric has been devised by Peter Veniero of New York City for use on rainy days. These come in various colors to match the brilliant colors of the raincoats now being used and are meant to form a part of mi-

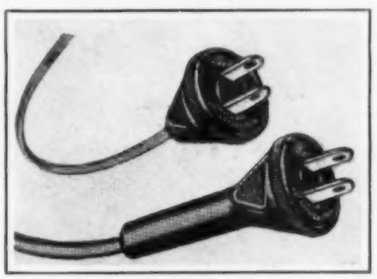
lady's rainy day outfit. The spat buttons up the side and is buckled under the instep. The top is ornamented with a fancy turned down cuff.

Rubber Neckties

A tie having a rubber balloon lining is the latest development in rubber manufactured articles which have made a recent appearance. The 'balloon' lining is intended to eliminate wrinkles and is a rubber sack which takes the place of the usual fabric lining and is inflated by blowing into a small tube at the end of the tie. When the tie is not in use or has been taken off for the night the sack is inflated and tends to stretch the tie fabrics, thereby smoothing out the creases and giving the tie a fresh-looking appearance. Rights to this new idea have been sold to a number of tie manufacturers and it will be featured in retail sales shortly.

Soft Rubber Plug

A line of solid soft rubber electric light plugs has been added to the products manufactured by the Belden Manufacturing Company, 2300 South Western Avenue, Chicago, Ill. The chief features of the new plug over the hard rubber plastic plug is the



Belden Rubber Plug

amount of rough treatment which the soft rubber plug will stand. They can be dropped, knocked about or jumped on without injury. They are shaped with a convenient grip for the fingers when plugging in or pulling out and are of an attractive appearance.

The plug is made in different shapes and sizes for various uses. The insulating qualities make them suitable for use in damp places or where a non-breakable plug is desirable.

The Belden soft rubber plug is sold only as a part of the Belden cord service and is furnished attached to this company's many varieties of cords.

Rubber Golf Tee

The Acushnet Process Co., New Bedford, Mass., reports an active selling season throughout the South on its all-rubber golf tee which was introduced last fall. A ready sale all over the country is expected when the golfing season opens in the North.

This tee, which has been given the name "O-Katy," is of very light construction, as

The O-Katy Golf Tee

is shown by the sectional view herewith. It is made of bright red rubber so that it is not easily lost. The design is claimed to be particularly good, the large cup offering secure support. The tee may be turned upside down for iron shots. The light weight offers no resistance to the follow through. The tees are packed five to a box which retails for 25 cents.

Rubber News Around the World

German Company Uses Exhibition Car

The Traveling Advertisement of the Phoenix Rubber Co., Harburg, Germany

PROGRESSIVE advertising methods are being used successfully by the Phoenix Rubber Company of Harburg, Germany. The firm is sending this specially equipped motor car all over Germany to serve as a travelling sample case. It contains many attractive exhibits of the company's goods and has an outfit for presenting motion pictures. There is also a complete wireless set. Phoenix is one of the oldest rubber companies in Germany, having been established in 1856.

OLD TIRES BECOME SHOES IN MEXICO AND GREECE

Old automobile tires are serving some of the population of Greece and Mexico as a form of footwear, according to reports released by the Department of Commerce.

In Greece they have been used as shoes in gradually increasing number until it is now estimated that at least 50,000 old casings are actually imported for making footwear. Unlike Greece, Mexico has a large local consumption of automobile casings and is not dependent upon outside sources.

I. R. I. Dinner

The annual dinner of the Institution of the Rubber Industry, London, will be held on April 26. The Right Hon. Lord Colwyn, president of the Institution, will preside. The program and list of speakers for the occasion have not yet been announced.

A total of 3,059,844 golf balls were imported into the United States during 1927 as against 3,361,248 in 1926. Practically all came from the United Kingdom and represented in value $1,234,137 in 1927 as compared with $1,377,205 in 1926.

CATALPO!

Rubber Industry Bill

The "Rubber Industry Bill," which has been reintroduced in the British Parliament and which authorizes the collection of a contribution by rubber manufacturers in Great Britain and Northern Ireland to the funds of the Research Association of the British Rubber and Tire Manufacturers, will have its second reading in the House of Commons on March 30. The original bill was commented upon at length in THE RUBBER AGE of November 25, 1927.

Opposition to the passage of the first bill came from manufacturers who were apprehensive that trade secrets would be exposed by the system of assessing manufacturers on a fixed basis per pound weight of rubber consumed. The present bill endeavors to meet this objection.

Danish Tire Market Grows

The consumption of automobile rubber goods in Denmark increased materially during 1927 and corresponded roughly to the increase in motor vehicles, according to reports of the Department of Commerce. The number of motor vehicles in use as of December 31, 1927 totaled 81,066. Consumption of tires is estimated at about two per car per year.

The total wholesale distribution of casings during 1927 was estimated at between 165,000 to 170,000 American tire sales have continued to show a steady increase and during 1927 American manufacturers obtained between 50 to 55 per cent of the business as compared with about 35 per cent in 1926.

TIRE EXPORTS FROM LEADING COUNTRIES

The comparative figures, secured from official sources, on automobile casings exported from the United States, Canada, United Kingdom and France for the year 1927 have been published in detail by the Department of Commerce showing the number shipped to each country of destination. The total number of casings in each case was as follows:

TIRE EXPORTS FROM LEADING COUNTRIES	
United States	2,811,156
Canada	1,679,126
United Kingdom	893,345
France	2,111,985
TOTAL	7,495,614

The compilation of the detailed table published by the Department of Commerce was rendered possible through the purchase of British and French export statistics from a fund established by the Rubber Association of America. Because of the unavailability of Italian figures and the incompleteness of the German statistics the table includes only the four above mentioned countries.

Dutch Rubber Profits

A recent issue of a Dutch publication *De Kroniek* publishes an anlysis of the results of 68 Dutch East Indies rubber plantation companies and casts an interesting sidelight on the prosperity of the Dutch rubber producing industry. The companies included in the analysis had a production in 1926 of 24,648 tons, or, roughly, 20 per cent of the total Dutch output, against 22,500 tons in 1925. The analysis shows that the net receipts from rubber sales by these companies in 1926 aggregated $15,882,200 as compared with $14,894,500 in 1925. After allowing for reserves, etc., $9,960,000 were distributed in dividends during 1926, the average rate of dividend being 15.5 per cent. Figures for 1927 are not yet available.

Export Managers Meet

The Export Managers Club of New York will hold its eighth annual meeting at the Hotel Pennsylvania, New York City, March 20. The membership of the club has grown to over 400 and the attendance including guests at the last annual conference exceeded 750. A number of export executives of rubber manufacturers are members of the club and will attend the sessions.

The North British Rubber Company, of England, have introduced a new type of rubber boot for children known as the "Hyandry." It is a Wellington boot with a soft extension to come up over the child's knee and can be tightened with straps and buckles, thus preventing any rain from beating against the knee.

Current Crude Rubber Items

NEWTON BILL NOT YET CALLED FOR DISCUSSION

The Newton Bill for the legalization of import combines had not yet been called for discussion on the floor of the House of Representatives up to March 6. As reported in the last issue of THE RUBBER AGE, the bill was favorably reported out by the Judiciary Committee and is now awaiting action. It would legalize "pool" purchasing of imported raw materials, such as rubber, when the Secretary of Commerce certifies that such commodities are not produced in the United States or are produced abroad under monopoly conditions.

Prominent legislators in Washington are already expressing their fears of a legislative jam which would keep many bills from being considered. The probabilities of such a development are believed to be particularly good in the Senate. Much routine legislation remains to be attended to so that every day's delay of any bill materially shortens its chances of being handled at the present session.

Three members of the Judiciary Committee filed a minority report when the bill was favorably reported. In this report attention is called to the dangers of monopoly legislation, particularly to the ultimate consumer. The filing of such a report indicates that the bill will be opposed when it is called for discussion in the House.

RUMORS AGAIN OF BRITISH AND DUTCH COOPERATION

There has been another flood of rumors during the past week regarding possible cooperation by the British and Dutch rubber plantation interests with a view making one last effort to carry out the restriction policy. At a recent meeting at The Hague, the Dutch Growers' Association appointed a committee to give consideration to the question of restriction for the benefit of the Dutch growers themselves, when and if they think it is necessary to take such action. It is believed, however, that the Dutch government is not an interested party to the idea and important factors in the trade who have close connections in the Netherlands are inclined to completely discount the importance of this latest step on the part of the Dutch Growers' Association.

WORK IS STARTED ON FORD'S PLANTATION

Reports from the Tapajoz region of Brazil, where Henry Ford's extensive rubber concession is located, indicate that work on the plantation development will be begun shortly. Experts are already on the ground making preliminary surveys in preparation for the extensive work which will be undertaken. It is reported that some laborers have already arrived and others are expected between now and June.

FOUR MORE BRITISH PLANTATIONS MERGE

Plans have been completed for further amalgamations of British-owned rubber estates in Java. The companies concerned are four moderate-sized enterprises, and include the British rubber estates of Java, Waverly Plantations, Toegoesari Rubber and Coffee Estates, and Tybar (Java) Plantations. The two latter are of recent origin, buf the two former were established in 1910 and 1914, respectively.

At present these undertakings collectively produce about 1,400,000 lbs. of rubber. Considered together, their paid-up capitals aggregate $3,090,000. The directors, while withholding for the present the terms upon which the provisional agreement has been made, expressed their unanimous approval of the amalgamation on account of economy and greater efficiency which will result in the administration of the estates and the marketing of the rubber.

CRUDE RUBBER MARKET STILL LOW BUT FIRMER

Prices Steadier Over Entire List Trading of Highly Speculative Character With Little Factory Business—March Goes to 28.20.

TRADING on the New York Rubber Exchange has been especially active during the last fortnight and in volume of sales in any one week all records were broken for the five trading days of the week ended February 25. Within the last week the market has shown a steadier tone and a slight improvement in price levels. The entire list has advanced over the last two weeks period from 70 to 80 points.

In spite of its quieter tone, however, there is a feeling of uncertainty still prevailing which has not been helped by the many rumors which have persisted. Speculation is still rife as regards the future developments in connection with the restriction scheme.

Estimated arrivals of crude rubber during February total approximately 32,000 tons. London stocks have shown slight declines and further reductions are expected.

The actual trading on the Exchange has been almost entirely of a speculative character and there has been little real factory business in hand.

March position has returned to 29.20 from the former low record of 28.20 prevailing on February 24. Futures have not improved in the same ratio as the nearby positions and even distant February is still below the 30.00 cent level.

The table on this page shows the daily closing prices and indicates the slight fluctuations which have ruled over the fortnight.

$100,000 for Rubber Research

The U. S. Department of Agriculture will have $100,000 available for rubber research during the next fiscal year if the appropriation bill for that department is approved by Congress in the form in which it has been passed by the Appropriations Committee of the House of Representatives. The item was given a separate hearing by the committee at which time Dr. Karl F. Kellermann of the Bureau of Plant Industry, Department of Agriculture, urged that the rubber research work be further extended. It has been carried on for several years, particularly in the Canal Zone and Haiti.

Closing Prices on Rubber Exchange of New York, Inc.

FEBRUARY 21 TO MARCH 6, 1928

Date	Spot	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Sales*
Feb. 21	28.50	28.50	28.60	28.70	28.80	28.80	28.90	28.90	28.90	28.90	28.90	29.00	——	2,432
23	28.60	28.80	29.30	29.30	29.30	29.40	29.40	29.40	29.40	29.40	29.40	29.40	——	2,133
24	28.30	28.20	28.30	28.40	28.50	28.50	28.60	28.60	28.70	28.70	28.70	28.80	——	1,974
25	28.40	28.30	28.50	28.80	28.80	28.90	29.00	29.00	29.10	29.10	29.10	29.20	——	308
27	28.70	28.70	29.00	29.50	29.50	29.60	29.60	29.60	29.70	29.80	29.90	30.00	——	941
28	28.50	28.40	28.90	29.20	29.30	29.40	29.40	29.40	29.40	29.40	29.50	29.60	——	1,516
29	29.00	28.90	29.30	29.50	29.60	29.60	29.70	29.80	29.80	29.80	29.80	29.90	——	973
Mar. 1	28.70	28.70	29.00	29.20	29.20	29.20	29.30	29.40	29.50	29.50	29.50	29.60	29.70	1,687
2	28.70	28.70	28.90	29.10	29.10	29.20	29.20	29.20	29.30	29.40	29.40	29.50	29.60	825
3	29.20	29.20	29.30	29.50	29.60	29.60	29.60	29.70	29.70	29.70	29.70	29.80	29.90	252
5	28.80	28.70	29.00	29.00	29.10	29.10	29.10	29.10	29.10	29.10	29.20	29.30	29.10	717
6	28.50	28.40	28.50	28.60	28.70	28.70	28.70	28.80	28.80	28.80	28.80	28.90	29.00	794

(*) In lots of 2¼ tons each

CATALPO!

GERMANY'S CHEMICAL COMBINE INVADES U. S.

Rumors have been persistent for some time within chemical circles to the effect that the great German chemical combine, the I. G. Farbenindustrie A. G., is seeking entrance into the American chemical market through the purchase in part or in whole of certain domestic chemical producers, including suppliers in the rubber chemical field. It is reported that the combine has already acquired substantial interests in the Grasselli Chemical Company, one of the largest manufacturers of chemical materials used in the rubber industry.

A recent bond issue floated by the German combine and totaling 250,000,000 marks is said to be for providing funds for extensive expansion abroad. A representative is also reported to be in the United States at the present time for the purpose of making certain contacts leading to the acquiring of some of the concerns which the Farbenindustrie plans to buy.

The Farbenindustrie has already formed a working agreement with the British Imperial Chemical Company, Ltd., the recently formed British combine.

The whole matter is being watched with interest and no little apprehension in chemical circles and has even had the attention of the government officials in Washington.

Sues on Patent Rights

The B. F. Goodrich Rubber Company and the Goodyear Tire & Rubber Company have been made parties to a suit instituted in the Federal Court at Newark, N. J., by C. O. Tingley & Company, of Rahway, N. J., charging infringement of patent rights on the manufacture of auto tire flaps. In the complaint both the Goodyear and Goodrich companies, who maintain offices in Newark, are charged with illegally using patent rights acquired January 13 last from William McCollum of Rahway.

COLUMBIA TIRE COMPANY HOLDS ANNUAL MEETING

The annual meeting of stockholders of the Columbia Tire & Rubber Company, Mansfield, O., was held February 11. While no financial statement was made public, the report of the secretary of the company indicated a very satisfactory business during 1927 with such excellent prospects for 1928 as to warrant a statement on the part of the officials of the company to the effect that an increase in production to 2,500 tires and 3,000 tubes per day will take place within the next month.

By unanimous vote the board of directors was re-elected, consisting of F. B. Black, E. S. Nail, F. M. Bushnell, E. O. Townsend, C. H. Henkel, W. B. Martin, G. W. Henne, S. D. Isely and H. R. Platt.

Immediately after the adjournment of the stockholders' meeting, the board elected the following officers: W. B. Martin, president; E. S N.ail, vice president; S. D. Isely, secretary and treasurer; and H. R. Platt, factory manager.

Fisk Issues Factory Paper

The first number of *The Fisk Candle*, a monthly paper devoted to the interests of the employees of the Fisk Rubber Company plant at Chicopee Falls, Mass., has made its appearance. Arthur M. Partridge is editor and is assisted by an editorial staff made up of representatives from every department of the factory.

Kansas Company Formed

The Western Rubber Products Corporation, with offices in the Barker Building, Kansas City, Kansas, has been granted a charter by the Kansas state charter board. The new company is capitalized at $100,000, and will engage in the manufacture of rubber composition tile flooring, paving expansion joints, composition paving blocks and kindred products.

The Archer Rubber Company, of Milford, Mass., manufacturers of rubberized fabrics have announced the development of their new rubberized plaid lined material for storm clothing which will be marketed under the trade name of "Archeroid." The new material will be furnished in a wide range of colors.

CATALPO!

IT PAYS TO MICRONIZE

PROTECTION

As every manufacturer knows, a hose wears out even more quickly from lack of use than from excessive service.

The inactive hose must be protected from sunlight, oil and grease, all of which spell deterioration. Allowance must also be made for stubborn kinks and the strain upon the hose when it has been coiled and hung up.

In use, it is subjected to dragging, stone cuts, sharp curves and other abuse.

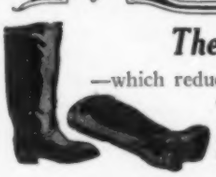
In order that the cover and the inner tube may be kept resilient under all conditions, the rubber compound must be strengthened with that agent which insures greatest tensile strength,—

MICRONEX

REG. U.S. PAT. OFF.

The World's Standard Gas Black

—which reduces deterioration, strain and the destructive forces of foreign elements and sunlight to a minimum.



Investigate the merits of MICRONEX at once. Quotations and samples upon request.

Binney & Smith Co
41 E. 42nd Street-New York City

NEW YORK RUBBER, INC. TO EXPAND OPERATIONS

At a recent meeting of the board of directors of the New York Rubber Corporation, held in New York City, L. D. Bigelow was re-elected vice-president and general manager in charge of plant operations and sales. Mr. Bigelow reports a steady growth of the company's business since its reorganization last March and is optimistic with regard to the outlook for the present year.

Sales have shown a substantial increase and with the new lines that are now being added the company is expected to double its present business during the current year. Additional equipment to the extent of approximately $75,000 has been installed and other plant changes are being made for the purpose of bringing about greater operating efficiency.

Mr. Bigelow started in the mechanical rubber goods business in 1904 at the plant of the Mechanical Rubber Company, Chicago, which was later taken over by the United States Rubber Co. It was largely through his efforts that the New York Rubber Company was completely reorganized last March by the Harrison-White interests of New York City.

The Mansfield Tire & Rubber Company, Mansfield, O., have appointed Hibbard, Spencer, Bartlett & Company, of Chicago, as distributors of their complete line of Mason tires and tubes.

The Philadelphia Rubber Works Company

Manufacturer of

RECLAIMED RUBBER

of

STANDARDIZED QUALITY

NEW YORK
52 Vanderbilt Ave.

AKRON, OHIO

OAKS, PA.
(Montgomery County)

CLASSIFIED ADVERTISING

10 cents a word, minimum charge $2.00, payable in advance.
Address replies to Box Numbers
THE RUBBER AGE
250 West 57th St., New York City

HELP WANTED

VANSUL, INC.

Distributors of chemicals and pigments to the rubber trade require a Sales Representative for the New York Metropolitan district. Requirements—technical training and manufacturing experience with sales personality. In reply specify qualifications. Automobile essential.

VANSUL, INC.
90 West St., New York City

EQUIPMENT FOR SALE

Farrel-Sykes Sheeter, 16 x 18 x 44". Completely equipped except for bed plate. In excellent working condition. Also 45 H. P. AC motor. Will sell separate or together. Address Box 478, THE RUBBER AGE.

Two-roll Friction Mill, 16 x 18 x 44". Complete with Bull gear. Can be seen by appointment. Also 45 H. P. AC Motor. Will sell separate or together.
Wilson-Western Sporting Goods Co.,
2037 Powell Ave., Chicago, Ill.

EQUIPMENT WANTED

One 8" x 20" Chill Roll Mixer, complete with gearing for motor drive—No motor wanted. Must be in good condition. Address Box 479, THE RUBBER AGE.

95% of Pure Rubber

Can be reclaimed from old tires and rubber goods with my invention. Need associate to establish factory or to buy my invention.

DR. J. L. NAVARRO
4419 So. Figueroa Street
Los Angeles, Cal.

Use the
Classified "Ads" of
THE RUBBER AGE
for Results

CATALPO!

LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

MARCH 6, 1928

COTTON

THE raw cotton market has been relatively steady during the past fortnight. The improved tone has lent confidence to the consuming trade and created a more general demand. The dry goods markets have also been more active. A report recently published by the Bureau of Agricultural Economics states that the increasing quantities of cotton cloth going into automobiles, rubber goods, wall covering, substitutes for leather, awnings, and other relatively new articles, has more than offset the change in styles of clothing and the increased competition from jute, rayon, silk and other textile materials.

High, low and closing prices, as of March 5, were as follows:

	March 5			Feb. 20
	High	Low	Close	Close
March	18.49	18.20	18.44	18.09
May	18.68	18.41	18.58	18.27
July	18.56	18.30	18.41	——

Tire Fabrics

While the tire fabric market has seen considerable activity in the way of inquiries during the last two weeks, few actual commitments of any size have been reported. It would seem that factories are intent on watching the drop in crude rubber and are too apprehensive of what effect the lower prices will have on tire prices, to make new fabric contracts.

Latest prices follow:

CORD			
Peeler, carded, 28/5/3	lb.	.44 @	.45½
Peeler, carded, 23/4/3	lb.	.43 @	.44
Peeler, carded, 18/3/3	lb.	.40 @	.41
Peeler, carded, 15/3/3	lb.	.41 @	.42
Egyptian, carded, 23/5/3	lb.	.54 @	.55
Egyptian, combed, 23/5/3	lb.	.59 @	.60
CHAFERS			
Carded American, 8 oz.	lb.	.37½ @	.38½
Carded, American, 10 oz.	lb.	.40 @	.41
Carded American, 12 oz.	lb.	.38 @	.41
Carded American, 14 oz.	lb.	.37 @	.41
LENO BREAKER			
Carded American, 8¼ oz.	lb.	.39 @	.41
Carded American, 10¼ oz.	lb.	.39 @	.41
SQUARE WOVEN			
Carded American, 17¼ oz. 23-11 ply	lb.	.44 @	.45
Carded American, 17¼ oz. 10-5 ply	lb.	.37 @	.38

Sheetings

A moderate trade in sheetings was enjoyed over the last fortnight with prices slightly lower and steady. Latest quotations on the leading grades used in the rubber industry are as follows:

40-inch 2.50-yard	yd.	.12½ @	.12¾
40-inch 2.85 yard	yd.	.10⅞ @	.11
40-inch 3.15 yard	yd.	.12 @	.12½
40-inch 3.60-yard	yd.	.10 @	.10¼
40-inch 3.75-yard	yd.	.08¼ @	.08½
40-inch 4.25-yard	yd.	.07¼ @	.07½

Ducks

An improvement is expected in the duck market although stocks on hand are said to be large. A price reduction, however, is helping to stimulate demand. In view of supplies on hand most of the mills have reduced production about 25 per cent. The late prices are as follows:

Belting and Hose	lb.	.34½ @	.35
Enameling	lb.	.35 @	.40
Shoe Ducks	lb.	.30 @	.33
Single filling	lb.	.15 @	.17
Double filling	lb.	.17 @	.18

RECLAIMED RUBBER

The reclaimed rubber market is reported active in spite of the sharp drop in crude rubber. Prices of reclaimed, however, have receded also and are now at new low levels. Movements of scrap to reclaimers are reported easier. The steadiness of the market at the new prices is encouraging factory demand. Late prices follow:

High Tensile			
Super-Reclaim No. 1 Black	lb.	.16 @	.16½
Super-Reclaim No. 2 Black	lb.	.13½ @	.14
High Tensile Red	lb.	.15¾ @	.16¼
Shoe			
Unwashed	lb.	.08 @	.08¼
Washed	lb.	.10 @	.10½
Tube			
No. 1 (Floating)	lb.	.16 @	.16½
No. 2 (Compounded)	lb.	.13½ @	.14
Tires			
Black, washed		.10 @	.10¼
Black, unwashed		.08¼ @	.08½
Black selected tires	lb.	.08¾ @	.09
Dark Gray	lb.	.11½ @	.12
Light Gray	lb.	.13 @	.13¼
White	lb.	.15 @	.15½
Truck, Heavy Gravity	lb.	.07½ @	.07¾
Truck, Light Gravity	lb.	.08 @	.08¼
Miscellaneous			
Mechanical Blends	lb.	.07 @	.08
Red	lb.	.14 @	.14½

Scrap Rubber

Collections of scrap are reported to be light and accumulations in the hand of dealers are lower. While the market has been active, the reduction in prices on crude and reclaimed rubber has tended to bring scrap grades lower, especially in the tube and tire grades. Latest quotations to consumers are as follows:

(Prices to Consumer)

Auto tire peelings	ton	35.00 @	36.00
Standard White auto	ton	65.00 @	67.50
Mixed auto	ton	25.00 @	25.50
Bicycle tires	ton	27.00 @	30.00
Clean solid truck tires	ton	26.00 @	27.00
Boots and shoes	lb.	.01¾ @	.01¾
Arctics, trimmed	lb.	.01⅞ @	.01½
Arctics, untrimmed	lb.	.01 @	.01¼
Inner tubes, No. 1	lb.	.07¾ @	.08
Inner tubes, No. 2, compounded		.05 @	.05½
Inner tubes, Red	lb.	.07¼ @	.07½
Air Brake Hose	ton	40.00 @	42.50
Rubber Hose	ton	18.00 @	20.00

CRUDE RUBBER

DEMAND for actual rubber on the New York outside market has been limited during the fortnight, with the price levels continuing to show a downward tendency. Factory demand was quiet and most of the trading was of a speculative nature. The uneasiness of the London market has continued to be reflected in the New York market and with plenty of rumors afloat the tone has been anything but one of steadiness. At the same time the daily fluctuations have been remarkably narrow. Spot ribbed smoke sheets declined to 28½ cents during the fortnight but while they have climbed back to around 29 cents no marked improvement is expected at once. London stocks declined slightly last week but shipments enroute to the United States still continue high and estimated arrivals during February total 32,000 tons. Prices on the New York outside market on March 5, were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot		.28¾ @	.29
March		.28¾ @	.29
April-May		.29¼ @	.29½
First Latex, crepe spot		.28¾ @	.29
Amber Crepe, No. 2		.26½ @	.27
Amber Crepe, No. 3		.26 @	.26½
Amber Crepe, No. 4		.25½ @	.26
Brown Crepe, Rolled		.23½ @	.24
Brown Crepe, Clean, thin		.26 @	.26½
Brown Crepe, specky		.24½ @	.25
Liquid Latex, per gal.		@	1.50
Paras—			
Up-river Fine		.29¾ @	.25
Up-river Medium		.21 @	.21½
Up-river Coarse		.19½ @	.20
Acre Bolivian, fine		.25 @	—
Caucho Ball, Upper		.19½ @	—
Islands, fine		.22 @	—
Centrals—			
Central, scrap		.18½ @	.19
Esmeraldas		.18½ @	.19
Guayule, washed and dried		— @	.23
Balata—			
Block, Colombia		.38 @	—
Block, Cuidad		.39 @	—

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers		
Spot	.13⅝ @	.13¾d
March	.13⅝ @	.13¾d
April-June	.13⅞ @	—

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers		
Spot	.13½ @	.13⅝d

Charles T. Wilson Co., Inc.
44 Beaver Street — New York

Importers of

CRUDE RUBBER

Members Rubber Exchange of New York, Inc.
Members Rubber Exchange Clearing House, Inc.

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CARBONATE—MAGNESIA—HEAVY CALCINED
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GUAYULE RUBBER

Washed and dry, ready for compounding. Invaluable in conjunction with Plantation Rubbers and Reclaims as an aid in Compounding.
Especially useful in all Friction Stocks.

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Entire freedom from bead trouble in the construction of straight side tires is assured by the use of either National "(Patent)" High Tensile Strength, Flat Woven, Bead Braid on our new (Pratt Patent) Bead Cables. These cables, made to dimensions specified, have seven strands, yet only one piece of wire is used without soldered, welded or brazed joint.

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The Hunter Process
in
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The successful drying of Rubber is essentially a problem of humidity control. The patented Hunter Process is used exclusively in Carrier Dryers. Carrier automatically controlled dryers reduce time, space and milling costs.

Write concerning your problem

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LATE RUBBER CHEMICAL PRICES

Accelerators — Colors — Softeners — Compounding Materials

MARCH 6, 1928

PRODUCERS of chemicals and compounding materials continue to report excellent conditions in the rubber trade. Shipments to manufacturers of tires and tubes are especially high with mechanicals, drug sundries and footwear plants following in close order. Reports from the various rubber centers show no let-up from peak production schedules of the past month and as the spring touring season is rapidly approaching everything points to a large turnover of tires within the next six weeks. This condition presages a healthy movement of chemicals for some time to come. The price situation is firm with practically no changes reported since last issue. A new accelerator Age-Rite Powder (phenyl-beta-naphthylamine) was announced on March 1, for which many advantages are claimed by its producers. Quotations follow:

ACCELERATORS

Organic				
A-7	lb.	.65	@	.85
A-11	lb.	.70	@	.90
A-16	lb.	.65	@	.85
A-19	lb.	.70	@	.90
A-20	lb.	.64	@	.80
Aldehyde ammonia, crystals	lb.	.65	@	.70
Aniline oil, drums, f.o.b. works	lb.	.15	@	.16¼
Crylene	lb.	.70	@	—
paste	lb.	.50	@	—
Di-Ortho-Tolyiguanidine	lb.	.80	@	.85
Diphenylguanidine	lb.	.64	@	.68
Ethylidene aniline	lb.	.60	@	.65
Formaldehyde Aniline	lb.	.36	@	.38
Grasselerator 102	lb.	.62½	@	.67½
Grasselerator 552	lb.	4.45	@	4.60
Grasselerator 808	lb.	1.05	@	1.35
Grasselerator 833	lb.	1.50	@	1.75
Heptene	lb.	.55	@	—
Hexamethylene-tetramine	lb.	.62½	@	.67½
Lithex	lb.	.18	@	.20
Methylenedianilide	lb.	.38	@	.40
Monex	lb.	3.25	@	—
Oxynone	lb.	.68	@	.90
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92	@	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45	@	4.60
R & H 40	lb.	.50	@	.55
R & H 50	lb.	.50	@	.55
Safex	lb.	1.20	@	1.25
Tensilac, No. 39	lb.	.55	@	.60
Tensilac, No. 41	lb.	.65	@	.70
Thermio F	lb.	.50	@	.55
Thiocarbanilide, drums	lb.	.25½	@	.26½
Thionex	lb.	3.25	@	—
Trimene	lb.	.75	@	—
base	lb.	1.20	@	1.35
Triphenylguanidine	lb.	.65	@	.70
Vulcanex	lb.	.82	@	.86
Vuleone	lb.	.70	@	.74
Vulcanol	lb.	1.05	@	1.08
Z 82	lb.	.75	@	1.00
Inorganic				
Lead, sublimed blue	lb.	.08¼	@	.08¾
Lead, white	lb.	.10½	@	.12½
Litharge, domestic	lb.	.09	@	.09¼
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)				
Blues				
Prussian	lb.	.33	@	.35
Ultramarine	lb.	.03	@	.35
Browns				
Sienna, Italian	lb.	.05	@	.12½
Umber, Turkey	lb.	.04½	@	.07
Greens				
Chrome, light	lb.	.27	@	.31
medium	lb.	.29	@	.32
dark	lb.	.31	@	.34
Chromium Oxide, bbl.	lb.	.28	@	.32
Reds				
Antimony crimson, 15/17	lb.	.40	@	—
sulphur free	lb.	.50	@	.52
golden 15/17 F.S.	lb.	.16	@	.25
Indian English (dom.)	lb.	.08	@	.10
Oximony	lb.	.13¼	@	—
Para toner	lb.	.13	@	.14
Red oxide, reduced	lb.	.10	@	.11
pure	lb.	.14	@	.15
Venetian red	lb.	.02	@	.06
Vermillion, quicksilver, English	lb.	1.85	@	1.95
Whites				
Lithophone, Akeolith	lb.	.05 3/5	@	.06
Lithophone, Azolith	lb.	.05¼	@	.05¾
Lithopone, Vanolith	lb.	.05¾	@	—
Titanox	lb.	.10	@	.10½
Cal. Base Pigment	lb.	.10	@	.10½
Zinc Oxide—American Process				
American Azo:				
ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06⅝	@	.07⅛
Zinc Oxide—French Process				
White seal	lb.	.11⅞	@	—
Green seal	lb.	.10⅞	@	—
Red Seal		.09⅞	@	—
Yellows				
Chrome	lb.	.17	@	.20
Ocher, French medium	lb.	.03½	@	.06
domestic	lb.	.01⅝	@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate	lb.	.10½	@	.12
Asbestine	ton	14.75	@	18.00
Barium carbonate	lb.	.03½	@	.05
Barium Dust	lb.	.05	@	.06
Barytes southern off-color,	ton	12.00	@	18.00
Western prime white	ton	23.00	@	—
imported	ton	27.00	@	36.00
Basofor	lb.	.04½	@	—
Blacks				
Arrow "Aerfloted"	lb.	.08	@	.12
Bone Black	lb.	.05½	@	.11
Carbon, compressed	lb.	.07½	@	.11½
Carbon, uncompressed	lb.	.07	@	.11
Drop Black	lb.	.06	@	.10
Lamp Black	lb.	.12	@	.40
Micronex	lb.	.08	@	.12
Velvetex carbon	lb.	.04	@	.07
Blanc fixe dry f.o.b. works	lb.	.04	@	—
Carrara filler	lb.	.01¾	@	.02
Catalpo (fact.)	lb.	.02	@	—
Chalk	ton	12.00	@	14.00
Clay, China, domestic	ton	8.00	@	9.00
Aerfloted Suprex	ton	9.00	@	20.00
Mineral Flour, c. l. fob mine	ton	20.00	@	23.00
Tensulite		15.00	@	—
Glues, extra white	lb.	.20	@	.24
medium white	lb.	.20	@	.24
common bone	lb.	.14	@	.15
Magnesia, carbonate	lb.	.08½	@	.11
Mica, powdered	ton	90.00	@	100.00
Rotten Stone (powdered)	lb.	.02½	@	.04½
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.30	@	3.70
Talc, domestic	ton	12.00	@	15.00
Velvetex	lb.	.04	@	.07
Whiting, commercial	cwt.	.85	@	1.00
English cliffstone	cwt.	1.50	@	—
Superfine	ton	10.00	@	12.00
Witco	ton	12.00	@	—
Wood pulp XXX	ton	45.00	@	—
Wood pulp X	ton	25.00	@	—
Zinc Carbonate	lb.	.10	@	.12

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Montezuma, solid	ton	28.00	@	36.00
Montezuma, granulated	ton	32.00	@	42.00
Paradura	ton	62.50	@	65.00
Pioneer, MR. solid	ton	42.00	@	45.00
Pioneer-granulated	ton	52.00	@	55.00
Robertson, MR. solid	ton	34.00	@	80.00
M.R. (gran)	ton	38.00	@	80.00

SOFTENERS

Acids				
Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulphuric, 60 degrees	ton	10.50	@	11.50
66 degrees	ton	15.00	@	16.00
Tartaric, crystals	lb.	.31½	@	—
Acids, Fatty				
Stearex	lb.	.10	@	.14
Stearic, single pressed	lb.	.10	@	.11
Double pressed	lb.	.11½	@	.12
Alkalies				
Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58% C.L.	cwt.	1.42½	@	1.45
Oils				
Castor, No. 3 bbls.	lb.	.13½	@	.14
Corn, crude, bbls.	lb.	.09¼	@	.11
refined	lb.	.11	@	.11½
Cottonseed, crude		.08½	@	.08¾
Cycline	gal.	.27	@	.34
Degras	lb.	.04¼	@	.04½
Fluxrite	lb.	.05	@	.06
Glycerine, C.P. drums	lb.	.26	@	.26½
Linseed, Raw C.L. bbl.	lb.	.09½	@	.10
Palm Lagos	lb.	.07¼	@	.07½
Niger	lb.	.07¾	@	.08
Vansulol	lb.	.10½	@	—
Para-Flux	gal.	.17	@	—
Peanut, domestic, crude	lb.	.12	@	.12¼
Petrolatum, white	lb.	08⅞	@	.09
amber	lb.	.03¾	@	.04
dark amber	lb.	.03⅜	@	.03½
Pine, steam distilled	lb.	.67	@	.69
Rapseed, refined	gal.	.80	@	.82
Rosin, first rectified	gal.	.55	@	—
second rectified	gal.	.58	@	—
Resins and Pitches				
Pitch, Burgundy	lb.	.06½	@	.07½
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	9.00	@	10.00
Rosin, grade K, 280 lb.	bbl.	9.90	@	—
Pigmentar	gal.	.33	@	.41
Tar Retort, 50 gal.	bbl.	13.00	@	14.00
Solvents				
Acetone, pure	lb.	.14½	@	—
Alcohol denatured, No. 1 bbls.	gal.	.37½	@	.44½
Benzol, 90%	gal.	.28	@	—
pure		.29	@	—
Carbon bisulphide	lb.	.05½	@	.06¼
Carbon tetrachloride		.06¾	@	.07½
Motor gasoline, steel bbls.	gal.	.17	@	—
Naptha, V. M. & P.	gal.	.14	@	—
Turpentine, spirits	gal.	.57½	@	.58½
wood	gal.	.43	@	—
Waxes				
Beeswax	lb.	.56	@	.58
Carnauba	lb.	.40	@	.50
Ceresin, white	lb.	.13	@	.14
Montan, crude	lb.	.07	@	.07½
Ozokerite, black	lb.	.30	@	—
green	lb.	.26	@	.30
Miscellaneous				
RSL Mold Solution	gal.	.75	@	.100

ANTI-OXIDANTS

Antox	lb.	.79	@	.83
Neozone	lb.	.74	@	—
Oxynone	lb.	.68	@	.90
Resistox	lb.	.60	@	.70
Stabilite	lb.	.65	@	—
VGB	lb.	.55	@	.66

SUBSTITUTES

Black	lb.	.08	@	.14
White	lb.	.10	@	.16
Brown	lb.	.08	@	.15

VULCANIZING INGREDIENTS

Sulphur Chloride (drums)	lb.	.03½	@	.06
Sulphur flour,				
Superfine bags	cwt.	2.20	@	2.80
Superfine, bbls.	cwt.	2.55	@	3.10
100% pure, refined, bags	cwt.	2.60	@	3.15
bbls.	cwt.	2.95	@	3.50

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

THE arrivals of crude rubber in the United States during February which have been estimated at 32,000 tons, together with the heavy weekly figures of invoiced rubber enroute to the United States, indicate that imports are continuing heavy in spite of the large stocks already on hand. Net imports during January reached 37,552 tons, the largest for any month since last April. On the other hand, it is estimated that consumption in February will be greater than in January.

A feature of the statistical position of crude rubber has been the consistent decline in London stocks during the last six weeks. The total reduction, however, has been only 5,000 tons.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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The crude rubber market has continued to weaken during the last fortnight as is shown by the daily closing quotations in the accompanying tables.

Spot rubber on the outside market declined to 28½ cents while on the Rubber Exchange March position touched 28.20. Cotton prices have steadied.

The figures covering the automobile production during January show the increased activity in that industry as do the increased figures covering rim inspections.

Latest figures covering imports and exports of rubber in the producing and consuming leading markets are included in appropriate tables in this section.

U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	425,142	338,998,697	35.59	27,775	24,735,488	39.77	403,472
1926:							
Jan.	42,404	72,528,151	76.36	2,084	3,747,505	80.28	40,320
Feb.	32,865	58,733,370	79.78	1,430	2,280,168	71.17	31,435
Mar.	42,152	70,589,581	74.76	1,836	2,735,234	66.51	40,316
Apr.	34,544	48,742,539	62.99	1,128	1,605,093	63.58	33,416
May	29,756	36,896,080	55.35	1,052	1,558,987	66.17	28,704
June	24,900	34,498,561	61.85	1,105	1,371,217	55.41	23,795
July	35,820	33,061,470	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.02	1,437	1,519,870	47.20	35,675
Oct.	29,333	25,300,483	38.50	1,366	1,316,270	43.02	27,967
Nov.	38,925	34,661,631	39.97	1,482	1,320,461	42.00	37,443
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
1927:							
Jan.	43,340	36,753,719	37.99	1,526	1,444,734	42.22	41,814
Feb.	28,338	23,110,257	36.41	2,451	2,277,297	41.47	25,887
Mar.	35,514	28,693,026	36.07	2,763	3,249,665	52.50	32,751
Apr.	46,202	37,284,806	36.15	1,575	1,428,425	40.45	44,627
May	36,543	30,998,657	37.87	2,782	2,501,562	41.74	33,761
June	33,045	27,833,770	36.28	1,775	1,550,592	38.99	31,270
July	37,678	31,678,259	37.53	1,958	1,560,853	35.58	35,720
Aug.	32,810	26,396,904	36.59	1,809	1,382,768	34.49	31,001
Sept.	33,301	23,852,857	33.73	3,500	3,036,929	34.91	29,801
Oct.	30,184	22,163,044	32.77	2,513	2,042,713	36.29	27,671
Nov.	38,113	27,039,129	31.67	2,468	2,014,196	36.43	36,123
Dec.	30,696	22,183,601	32.26	2,654	2,245,754	37.77	28,042
1928:							
Jan.	39,108	30,278,444	34.56	1,988	1,734,[illegible]	38.95	37,552
Feb.							
Mar.							
Apr.							
May							
June							
July							
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

*Official estimates based on arrivals at New York and Boston.

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	5,045	16,938	30,106	29,058	29,638	32,196	31,518	34,403
Feb.	5,955	14,767	30,149	25,736	29,761	31,136	30,137	
Mar.	9,190	21,408	36,629	28,385	33,498	32,936	36,141	
Apr.	13,084	19,294	29,085	27,129	34,139	32,696	35,871	
May	16,023	23,246	36,155	25,845	35,322	29,364	34,592	
June	16,142	31,713	24,272	22,753	35,822	28,598	33,801	
July	18,310	24,522	17,685	23,396	36,053	27,577	29,219	
Aug.	23,649	29,361	20,359	28,982	35,909	34,533	33,460	
Sept.	16,705	24,410	17,594	31,497	31,691	32,904	27,214	
Oct.	16,814	26,881	21,321	31,520	29,047	29,836	26,790	
Nov.	14,105	24,950	20,437	27,289	28,853	28,080	26,792	
Dec.	15,482	25,070	21,902	27,199	28,748	26,298	25,492	
Totals	170,504	282,560	305,694	328,769	388,481	366,149	371,027	

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927
Jan./Mar.			96,776	87,609	95,263	94,301	99,216
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242
July/Sept.			55,621	83,813	99,493	93,793	89,893
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	83,212	
Totals	171,425	282,427	305,507	339,752	384,644	358,415	

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
December 24	5,483	1,030	1,487	1,229	9,229
December 31	4,810	719	1,988	268	7,785
January 7	4,569	357	1,828	158	6,912
January 14	4,546	475	1,200	302	6,523
January 21	4,654	1,290	2,518	608	9,070
January 28	4,469	420	975	212	6,076
February 4	3,733	948	1,779	668	7,128
February 11	4,994	733	1,089	1,155	7,971
February 18	4,717	1,256	1,469	1,147	8,589
February 25	6,147	613	1,664	240	8,664

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1926																																
July	81⅛	81⅞	85⅝	—	—	88⅛	90½	95⅛	94⅞	99⅞	106⅜	—	110	105⅜	110⅝	117	116⅝	115⅞	119	121	117⅞	119	117⅜	112¾	112⅝	—	107¾	96⅝	93¾	89¾	93¾	103⅛
August	94⅞	—	88⅜	85⅜	86⅜	86⅜	81¾	79	71⅜	72⅞	86½	76½	81½	80⅜	77⅝	—	78⅜	80⅞	80⅜	68½	82⅞	82⅞	—	82	82⅞	85¼	85⅜	85⅜	87⅜	89⅜	90	83
September	88¾	87¼	85	81¾	—	—	—	78¾	83	80½	83	92	92½	80⅝	93⅞	92⅝	92⅝	92	94⅜	—	92	93¾	93½	90	89	—	89	91¾	91½	—	—	86⅞
October	91¾	91¼	92	—	94½	97	97	99	99¼	101	—	92	97¾	95½	97	99¼	99	107	109⅜	110⅜	102	99¼	99¾	99¼	106⅞	98	—	99⅜	101½	99¾	100⅜	95
November	—	99¾	—	98⅜	98⅜	100	—	100⅜	—	98⅝	99½	100⅜	101⅜	104⅝	106½	—	109	107	109⅝	110⅜	110½	109	110½	109	—	—	108⅜	108⅝	93	107	—	104⅜
December	106⅜	108½	107⅜	107¾	108¾	—	108	109	—	109¾	106	105⅞	105⅞	—	101	99¼	90¼	93	86⅜	—	88¾	90¾	88¾	88⅝	—	—	—	91	—	91¾	91¾	98½
1926																																
January	—	—	87	87¼	85½	86½	87½	87¾	—	88¾	88¼	88¼	85½	84½	82½	—	75½	75½	73½	75	72	72½	—	68	66½	67	69¾	70½	69	—	—	79½
February	—	67	66¼	68	66¾	69	—	—	67	65	66	66	65½	—	63	60½	60½	60	59	60	—	56	55	55	51¾	51	51	51¾	—	—	—	62¾
March	55	58	58	53½	53½	57½	—	—	56	55½	61	60	63	62	62	60½	61	62	61	61½	63½	—	61½	61	60	69½	60	68	58	58	—	59
April	59	—	59	59	58	56½	56½	53	—	51½	50½	—	61½	—	60½	61	62	60½	61	47½	48½	48	48	48	48	48	48	48	48½	—	—	51¾
May	48½	—	50	60¾	49¾	49¾	49½	—	49	49½	49½	49	49½	49¼	47⅝	47½	47	47	47	47½	47½	47	46⅝	46	46	45	45	43	—	—	—	47⅜
June	41½	42	41½	43	41½	41½	41½	42	43	41½	42	42	41½	42	43½	—	43	43	44	44	44	41	43½	43½	42	42	43	42	42	—	39	42⅞
July	42	42	42	38½	38¾	37	37	38¼	38¼	41½	43½	41½	41½	43½	41½	40	40	40	40	41½	41½	41	41½	41½	42	41½	41	41	42	39¾	40	41¾
August	—	40¼	40¼	38¾	40¼	40¼	40¼	40¼	40¼	40¼	40¼	38½	40¼	40¼	40¼	40½	43½	43½	42½	41½	41½	39	39	39	39	39	39½	39½	39½	39½	40	38¾
September	43	43	—	41¾	42¾	42¾	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42¾	42½	42½	42½	—	41
October	41¼	41¼	41	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	42½	42½	42½	42½	—	42½
November	36¾	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	37½	—	37½
December	—	37½	—	—	—	37½	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1927																																
January	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
February	—	37½	—	38½	39	39¾	40¾	40¾	—	40½	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾
March	39¾	39¾	39¾	40¾	39¾	37½	37¾	37¾	37¾	38	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾
April	41¾	41¼	40¾	41	41	40¾	40¾	40¾	40¾	40¾	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼
May	—	40½	40¾	40½	40½	41¼	41¼	41¼	41¼	41¼	—	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼
June	40¾	40¼	40¼	—	—	—	—	—	40¾	40¾	—	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾
July	35½	—	—	35¼	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½
August	35½	34	33¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sept.	33¾	—	—	33¼	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾
Oct.	35	35¼	35½	35½	35½	36¾	36¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nov.	40½	40¾	40½	—	—	—	—	—	—	40½	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dec.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1928																																
January	—	37½	—	41¼	41¼	41¼	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
February	—	37¾	—	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾	37¾
March	29	28⅞	—	28⅞	28⅞	28⅞	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
April	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	
May	15.25	27.39	18.89	58.47	47.75	40.76	
June	15.11	26.88	18.81	77.26	42.50	37.25	
July	14.67	26.10	22.16	103.16	41.03	34.44	
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Sixth Restriction Year—Second Quarter

Day	Feb.	Mar.	Apr.	Day	Feb.	Mar.	Apr.
1	18⅜	13⅞		17	15⅝		
2	17¾	13¾		18	15¼		
3	18	13¾		19	—		
4	17⅞	—		20	14¾		
5	—	13⅜		21	14⅝		
6	17¾			22	14⅜		
7	17¾			23	14⅝		
8	17⅞			24	13¾		
9	16¼			25	13¾		
10	16⅛			26	—		
11	16⅝			27	14		
12	—			28	14⅛		
13	15⅞			29	13⅞		
14	15⅝			30			
15	15⅝			31			
16	15½						

(The average price for the period for which daily prices are reported above is approximately 15.413 pence. The British Colonial Secretary has announced that only 60% of the standard production will be exportable from the restricted area during the next quarter if the price during the entire current quarter does not average at least 21 pence.)

Average Price in Previous Quarters

Quarter	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28
Nov.-Jan.	14.285	14.175	17.9983	46.709	19.265	19.023
Feb.-Apr.	16.858	12.917	19.356	28.103	19.696	
May-July	14.242	10.947	38.469	21.001	18.165	
Aug.-Oct.	14.944	14.632	43.269	20.199	16.620	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Feb. Cents	Mar. Cents	Day of Month	Feb. Cents	Mar. Cents	Day of Month	Feb. Cents	Mar. Cents
1	17.75	18.95	11	18.50	——	21	18.50	——
2	17.45	18.90	12	——	——	22	——	——
3	17.65	18.70	13	——	——	23	18.50	——
4	17.50	——	14	18.70	——	24	19.00	——
5	——	18.95	15	18.45	——	25	19.00	——
6	17.90	——	16	18.45	——	26	——	——
7	18.05	——	17	18.35	——	27	19.00	——
8	18.15	——	18	18.50	——	28	18.70	——
9	18.25	——	19	——	——	29	18.90	——
10	18.45	——	20	18.60	——	30	——	——
						31	——	——

Average Monthly Price Per Pound

Month	1926 Cents	1927 Cents	1928 Cents	Month	1926 Cents	1927 Cents	1928 Cents
Jan.	20.85	13.42	19.12	Aug.	18.57	20.04	——
Feb.	20.60	14.10	18.40	Sept.	17.02	21.95	——
Mar.	19.35	14.32	——	Oct.	13.14	20.55	——
Apr.	19.13	14.75	——	Nov.	12.86	20.22	——
May	18.92	16.07	——	Dec.	12.68	19.58	——
June	18.57	16.85	——	Average for Year	17.53	17.49	——
July	18.71	18.00	——				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	55,198	76,172	110,244	46,296	45,312	41,256	100,434	121,484	151,500
Feb.	58,035	91,186		46,935	42,166		104,970	133,352	
March	61,822	85,740		43,567	49,600		105,389	135,340	
April	55,261	92,757		41,905	38,963		97,166	131,720	
May	64,360	94,563		40,303	44,181		104,663	138,744	
June	60,460	89,250		40,907	47,233		101,367	136,483	
July	64,900	98,469		38,062	40,587		102,962	139,056	
Aug.	60,870	96,148		37,360	40,937		98,230	137,085	
Sept.	62,078	97,829		42,464	37,966		105,542	135,793	
Oct.	64,089	97,452		52,930	42,804		117,919	140,256	
Nov.	69,385	101,034		47,311	37,076		116,696	138,110	
Dec.	72,520	100,130		52,020	47,938		124,540	148,068	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1920	1921	1922	1923	1924	1925	1926	1927
Jan.	19,300	56,573	67,252	73,498	57,460	27,172	9,994	54,994
Feb.	18,329	59,439	67,623	70,483	56,732	23,425	10,004	58,826
Mar.	18,969	63,913	66,670	63,438	55,647	18,104	13,127	63,055
Apr.	20,072	68,759	68,637	58,770	54,559	12,949	13,773	66,897
May	20,921	70,403	70,146	54,439	51,615	5,895	20,384	67,169
June	22,517	69,408	71,597	51,050	51,115	5,318	23,984	63,902
July	25,346	71,065	71,515	49,937	52,073	4,258	27,727	63,717
Aug.	30,674	73,211	72,112	58,427	49,700	4,619	30,165	64,491
Sept.	35,504	72,175	70,977	54,523	44,011	5,453	35,077	68,236
Oct.	41,748	69,229	68,536	58,891	37,523	5,086	42,138	69,569
Nov.	45,550	70,786	68,548	60,074	33,593	3,869	44,057	67,050
Dec.	50,652	69,792	72,299	60,246	29,488	5,697	46,918	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1927					
July	63,917	64,163	63,511	62,819	63,626
August	64,177	64,557	64,842	64,259	
September	65,162	66,148	66,664	67,253	
October	68,519	70,167	70,916	70,060	69,551
November	69,660	69,501	69,850	67,318	
December	65,869	66,011	64,761	63,397	63,207
1928					
January	64,360	65,524	65,450	66,285	
February	65,909	64,945	63,769	63,103	
March	61,978				
April					
May					
June					

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1926	1927	1928	End of	1926	1927	1928
Jan.	16,726	25,440	25,868	July	23,101	22,558	
Feb.	13,653	26,766		Aug.	23,362	25,764	
Mar.	18,389	27,844		Sept.	25,997	25,178	
Apr.	16,328	24,543		Oct.	26,614	25,790	
May	16,967	25,133		Nov.	25,486	28,369	
June	19,416	21,898		Dec.	26,443	25,798	

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1925	26,001,664	66.8
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1927			1928		
July	1,679,587	84.4	January	1,811,534	87.8
August	1,825,905	80.2	February		
September	1,727,122	77.7	March		
October	1,354,924	81.4	April		
November	838,591	67.8	May		
December	1,134,421	80.0	June		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1924	1925	1925	1927	1928
January	11,918,000	14,386,000	17,582,000	17,888,000	20,939,000
February	9,626,000	13,210,000	15,814,000	18,240,000	
March	10,961,000	14,890,000	19,302,000	22,464,000	
April	14,583,000	19,013,000	20,848,000	23,371,000	
May	15,889,000	20,459,000	24,213,000	26,579,000	
June	16,421,000	20,724,000	23,803,000	27,799,000	
July	18,610,000	22,879,000	24,752,000	29,784,000	
August	19,825,000	22,323,000	26,912,000	29,779,000	
September	16,871,000	20,177,000	22,929,000	28,409,000	
October	18,029,000	19,826,000	23,973,000	25,497,000	
November	16,607,000	18,024,000	20,618,000	24,400,000	
December	15,663,000	17,954,000	21,419,000	23,718,000	
TOTAL	185,003,000	223,865,000	262,165,000	297,928,000	20,939,000

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	40,932	45,259	51,633	60,845	61,237	64,439
Shipments	39,987	45,204	50,120	59,262	59,002	64,059
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
Jan.	4,740	4,587	4,965	4,013	2,974	4,932	7,949	9,947	10,432
Feb.	4,908	4,865	5,095	3,924	3,436	4,458	8,928	11,164	11,075
Mar.	5,276	5,456	6,276	4,657	4,561	5,701	9,510	12,004	11,583
Apr.	5,341	5,346	6,299	5,498	4,980	5,701	9,088	12,461	12,122
May	5,467	5,023	6,151	5,954	5,211	5,657	8,611	12,343	12,462
June	5,418	5,422	6,202	6,737	5,724	6,253	7,243	11,968	12,462
July	5,587	4,950	5,087	6,298	6,337	5,973	6,421	10,592	11,326
Aug.	5,607	5,872	5,752	4,760	6,744	6,393	7,261	9,732	10,721
Sept.	5,007	5,706	4,822	4,569	6,040	5,717	7,681	9,318	9,722
Oct.	4,505	5,103	4,773	5,580	4,544	4,799	6,670	9,917	9,665
Nov.	4,229	4,324	4,502	3,671	3,733	4,306	6,955	10,297	10,136
Dec.	4,760	4,683	4,497	3,601	4,718	4,165	8,142	10,456	10,264

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	50,850	60,116	70,706	82,614	76,618	70,823
Shipments	49,673	59,072	68,016	81,004	71,591	72,896
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
Jan.	6,343	6,809	5,337	5,576	3,723	6,016	11,570	14,361	15,585
Feb.	6,339	6,825	5,658	4,971	3,736	5,120	13,023	17,090	16,075
Mar.	7,000	7,030	7,184	5,711	4,987	6,157	14,236	19,131	17,096
Apr.	6,851	6,554	7,373	6,704	5,051	6,359	13,618	20,674	17,801
May	6,846	6,149	6,737	8,040	6,304	6,140	12,501	21,141	18,389
June	6,942	6,171	6,306	9,032	6,898	6,832	10,409	20,243	17,858
July	7,544	5,729	5,284	9,140	8,569	7,070	8,635	17,267	16,004
Aug.	7,618	7,424	6,480	6,923	9,579	7,983	9,271	15,462	14,664
Sept.	7,254	7,590	5,651	6,665	7,762	6,758	9,950	15,312	13,511
Oct.	6,612	6,208	5,065	7,845	5,474	5,024	8,726	15,929	13,539
Nov.	6,266	4,852	4,775	5,406	4,045	4,723	9,941	16,604	13,585
Dec.	6,999	5,277	4,969	4,991	5,463	4,712	11,313	16,200	13,692

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1921	1,595,304	1,452,902	142,402	66,246	61,098	5,148	1,661,550
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
Jan.	238,926	199,650	39,276	15,376	11,745	3,631	254,302
Feb.	304,758	264,171	40,587	18,655	14,826	3,829	323,413
March	394,430	345,911	48,519	23,250	19,723	3,527	417,680
April	404,743	357,009	47,734	24,611	20,890	3,721	429,354
May	404,099	357,148	46,951	25,708	21,991	3,717	429,807
June	321,959	278,728	43,231	19,208	16,470	2,738	341,167
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	136,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	233,502
Feb.							
March							
April							
May							
June							
July							
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[3]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley[6]	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,755	188,567	55,356	11,321	10,923	6,308*	5,562	55,297	77,815	142,171	8,645	28,768	14,968	*605,701
1926:															
Jan.	30,452	10,237	20,215	4,246	1,273	416	472	289	4,110	6,239	8,165	866	1,284	1,805	49,380
Feb.	30,440	8,306	22,134	5,120	725	488	450	253	4,524	5,717	6,854	554	2,759	1,978	51,556
Mar.	35,012	14,800	20,212	5,177	1,113	792	561	418	4,527	5,566	11,984	573	2,126	1,899	54,948
Apr.	23,727	10,565	13,162	3,766	590	679	374	293	4,226	4,598	6,285	410	2,318	1,529	38,230
May	31,231	10,604	20,627	3,944	691	927	410	279	4,440	5,358	8,737	502	1,353	1,464	48,732
June	30,624	11,764	18,860	4,208	452	779	512	275	4,444	6,125	10,614	549	1,213	1,279	49,310
July	28,824	15,280	13,544	4,422	938	911	498	439	4,618	5,612	13,112	1,521	1,565	1,148	48,328
Aug.	34,625	13,595	21,030	5,666	521	890	476	316	4,132	5,699	10,390	378	1,888	1,097	52,483
Sept.	35,913	13,972	21,941	6,015	651	888	689	457	4,065	6,568	11,391	681	2,156	822	56,324
Oct.	39,367	15,203	24,164	5,672	634	805	473	385	4,058	6,998	11,491	661	1,904	1,023	58,268
Nov.	34,302	12,201	22,101	4,228	1,110	685	547	285	3,988	5,816	9,422	718	1,911	1,259	52,070
Dec.	36,811	14,716	22,095	6,498	1,176	895	617	338	5,054	7,117	12,786	790	3,821	714	61,901
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	585	304	4,187	6,706	10,690	941	2,885	981	55,807
Feb.	27,523	11,607	15,921	3,571	1,469	552	445	360	4,078	6,526	10,535	675	2,082	1,098	47,312
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,203	1,791	65,509
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,531	10,197	557	2,374	1,495	46,826
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,431	1,207	49,928
June	32,607	14,706	17,901	3,348	856	1,100	539	409	4,818	5,518	9,109	772	1,030	1,706	47,106
July	25,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,713	1,115	43,657
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	2,004	969	48,779
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,474	1,213	48,468
Oct.	29,846	15,801	14,045	5,245	802	721	500*	542	3,810	7,755	13,633	775	2,704	1,155*	*51,687
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	500*	600	4,127	6,587	14,395	683	2,547	1,196*	*46,034
Dec.	32,185	17,865	14,320	4,130	1,395	946	500*	664	5,763	7,878	13,438	1,191	3,321	1,042*	*54,588
1928:															
Jan.	27,731	16,618	11,113	4,352	1,605	842	500*	525				720	1,612		
Feb.															

(1) Mayalan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, and 3,263 in 1926. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, and about 20 tons in 1926. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, and about 60 tons in 1926. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Italy, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States*	United Kingdom	France (h)	Germany	Canada (ac)	Japan (ac)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1926:															
January	40,345	6,886	2,832	703	2,188	892	760	332	438	76	163	303	89	134	56,141
February	31,435	3,114	3,063	1,113	1,865	741	1,041	643	512	143	88	397	145	75	44,375
March	40,316	8,907	3,941	1,342	2,079	864	1,037	832	547	129	227	377	109	161	60,868
April	33,416	8,275	4,121	1,781	1,615	1,868	865	402	505	71	93	335	130	193	53,670
May	28,705	6,773	2,519	1,848	1,239	1,010	705	200	468	186	241	225	60	192	44,371
June	23,795	5,894	2,196	1,655	1,188	1,465	1,070	983	636	269	215	303	123	103	39,895
July	34,266	6,768	2,352	2,202	1,552	1,447	800	132	702	295	480	292	121	115	51,524
August	26,081	7,327	2,457	2,110	1,888	1,284	796	655	1,275	303	594	336	90	151	45,347
September	35,675	8,843	1,774	2,029	1,355	1,922	819	472	1,241	283	429	317	91	138	55,388
October	28,110	8,082	3,376	2,423	1,865	2,396	645	585	1,004	301	2	360	100	121	49,370
November	37,673	9,247	2,719	3,007	1,548	3,380	832	568	916	194	-18	358	90	181	60,695
December	35,850	4,749	2,890	2,562	1,847	856	439	725	777	248	156	443	151	306	51,999
1927:															
January	41,815	10,192	3,284	2,481	1,936	1,227	672	803	929	296	192	316	139	100	64,382
February	25,886	7,692	3,263	3,103	2,620	1,902	601	907	460	502	152	336	146	210	47,780
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,310	2,393	1,509	2,181	781	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	887	694	626	-57	335	155	223	49,402
June	31,270	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	46,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	188	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	158	363	49,538
November	36,193	1,697	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300*	47,028
	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,492	636	4,224	2,055	2,672	627,789
1928:															
Jan.	37,552			2,485	2,290										
Feb.															

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—United Kingdom exports to Russia, and beginning with October, 1927, exports from the United States to Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation: such imports amounted to 4,305 tons in 1926 and to 4,988 tons in 1927.

BOOK REVIEWS

R & H Advertising. A manual of advertisements of the Roessler & Hasslacher Chemical Company. New York. 1928.

The booklet covers the advertising campaign of the Roessler & Hasslacher Chemical Company, and is published for the benefit of their salesmen, distributors and customers. The advertisements are attractively designed to express and clarify the desirable features of the company's chemicals and the service which is offered in connection therewith.

A Manual of Rubber Planting Companies. Compiled by Zorn & Leigh Hunt, London. For Private Circulation Only. February 1928. 140 pp.

The original edition of this manual was published as early as 1907 and comprised brief details concerning about 100 undertakings—practically all the sterling plantation companies known at that time. By February, 1914, when the eighth edition was published it included particulars on over 600 companies. During the war years publication was suspended and resumed in 1923. The present volume is the thirteenth edition. While it is not intended that every known rubber plantation company be included in the book the selection covers a wide field and embraces particulars on more than 500 companies. The book also contains a very comprehensive survey of the operation of the Stevenson Restriction Scheme.

Paying Employees By Check, Report No. 53. Published by the Policyholders Service Bureau of the Metropolitan Life Insurance Company, New York City, N. Y. 1928. 20 pp.

This survey of check payment methods contains data gathered from 54 prominent companies which have a check payment plan now in operation. In advocating such payment methods the Policyholders Service Bureau of the Metropolitan Life Insurance Companys calls attention to the prevalency of payroll robberies, which often means the loss of an employee's life and the safety, thrift and economy which may result through the adoption of the check payment plan.

Rubber—Commodities of Commerce Series No. 15. Published by the Pan American Union, Washington, D. C. 1928. 36 pp.

The pamphlet is one of a series of educational brochures descriptive of various industries in Latin America. The particular booklet under review describes briefly the history of rubber gathering in the Amazon region with a passing reference to the development of the plantation industry in the Middle East and its relation to the Brazilian rubber trade. It is liberally illustrated with some excellent views of the region and rubber gathering by the natives. An interesting description of the proposed Ford project is also given. Dr. William A. Reid, of the staff of the Pan American Union, is the author.

U. S. Imports of Guayule Rubber in 1927

1927:	*Quantity Pounds*	*Long Tons*	*Unit Value Cents*	*Declared Value Dollars*
January	655,100	292	$154,533	23.59
February	954,048	426	229,286	24.03
March	1,019,740	455	253,988	24.91
April	1,099,987	491	271,402	24.67
May	893,661	399	222,419	24.89
June	949,846	425	213,982	22.53
July	886,854	397	206,780	23.32
August	779,500	348	186,937	23.98
September	1,037,500	463	242,545	23.38
October	1,018,942	455	239,868	23.54
November	1,110,200	496	258,137	23.25
December	766,875	342	179,448	23.40
TOTAL	11,174,253	4,989	$2,639,325	23.80

Soap Widely Used in Industry

Twelve per cent of all the soap used in the United States is consumed in industry, a recent analysis shows. The industrial consumption is reported as 300,000,000 pounds per year. Soap is used in more than 30 manufacturing industries. Among these is the rubber industry in which soap is used as a mold wash to prevent the rubber article from sticking to the mold.

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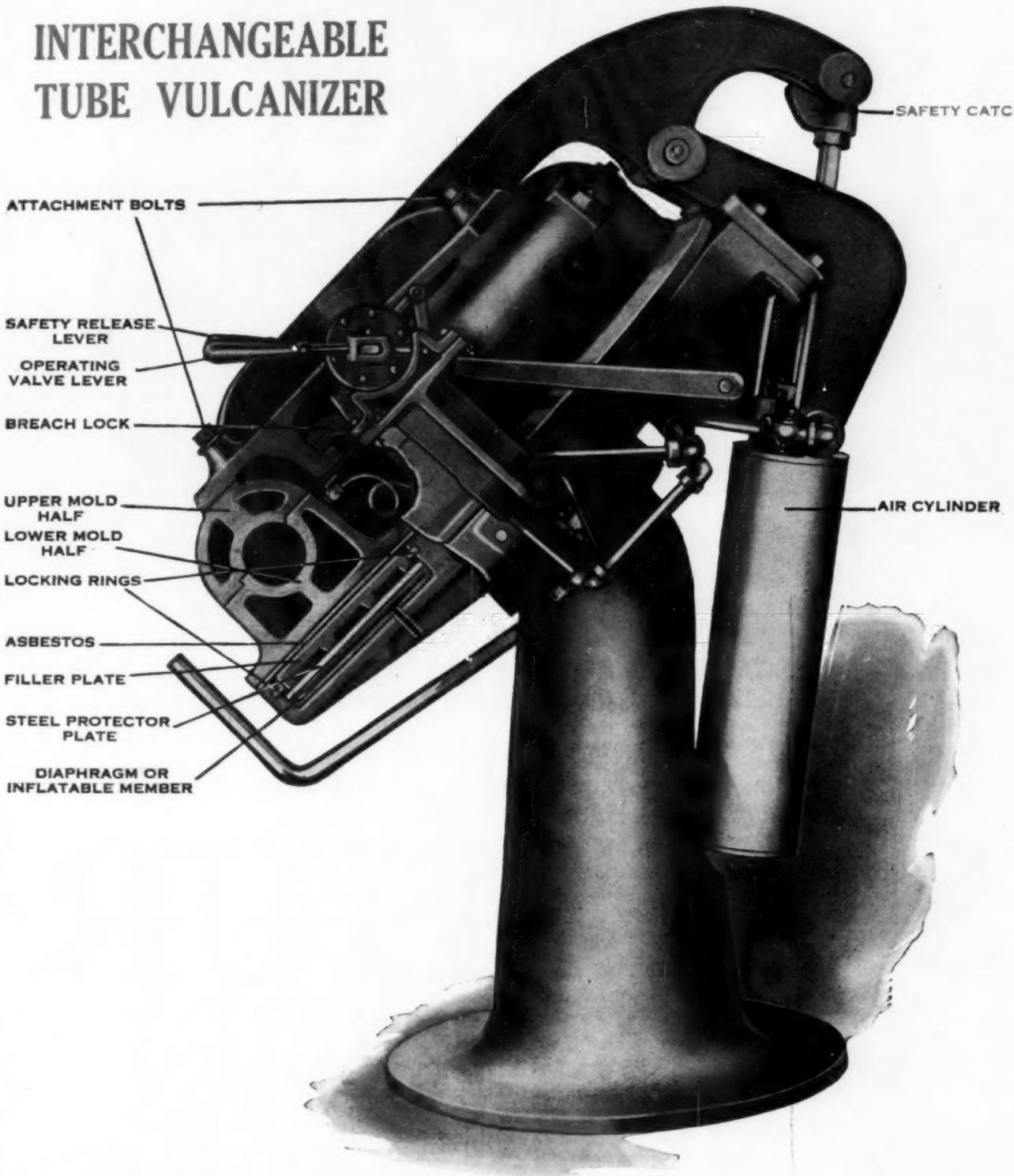

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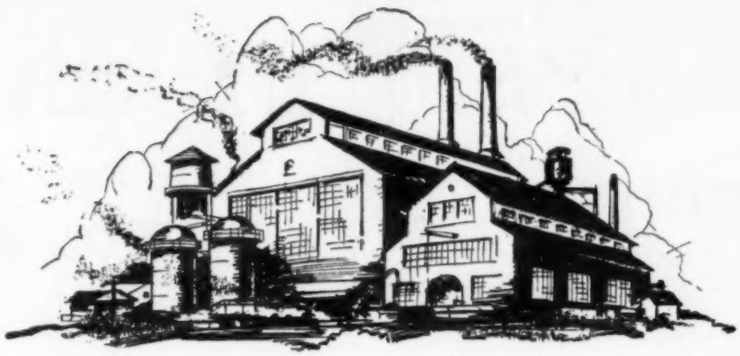

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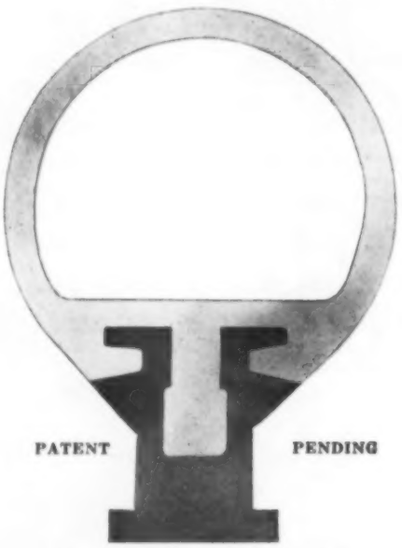

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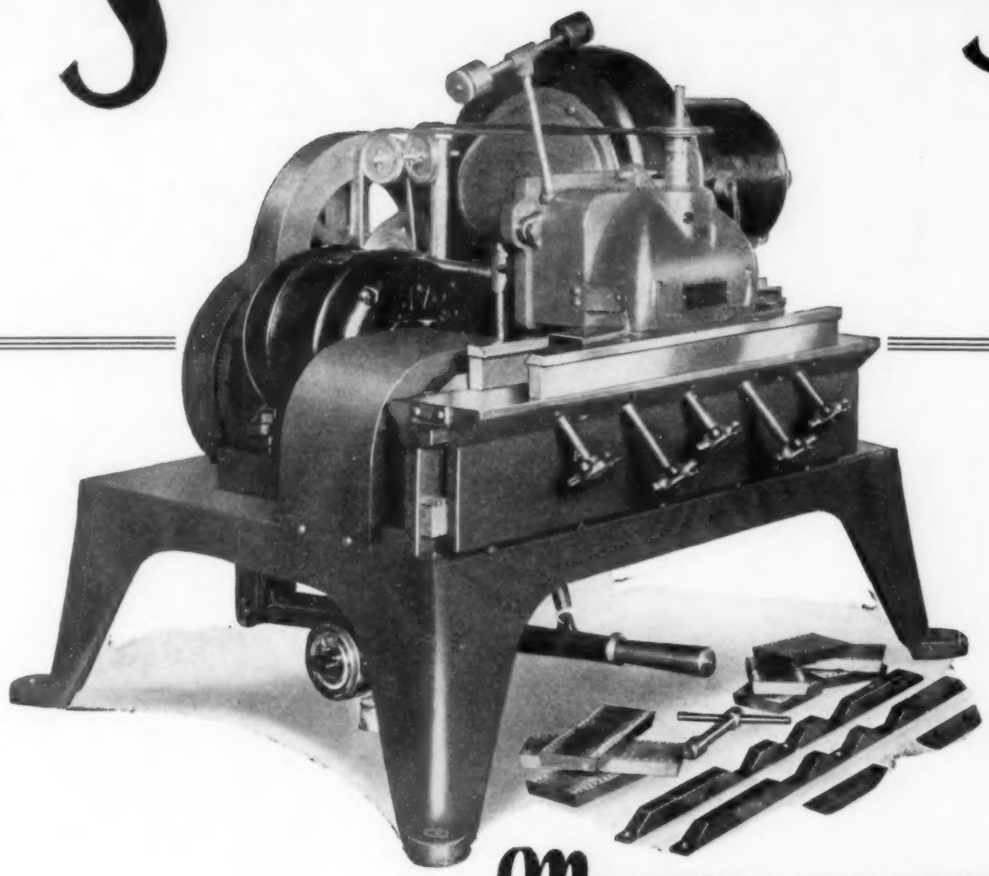

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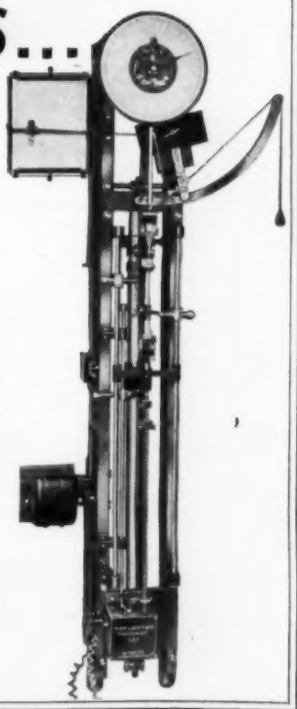

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A Market In the Air

A DAILY increasing market is opening up to the tire manufacturer with the widening use of airplanes in commercial life. The larger rubber manufacturing companies already have had visions of the sales possibilities in the tire equipment of aircraft and have actually organized divisions of their sales departments to develop this new selling field. Little, however, has been published as to how these tires differ from the automobile grades or as to the technique of their construction. The leading article in this issue of THE RUBBER AGE covers the subject in considerable detail and is by an authority in this field. The subject is comparatively new, but will offer many important problems and be a large field for the manufacturing industry within the next few years. THE RUBBER AGE is glad to give so full a presentation of this timely subject.

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